



Hornsby Shire Council



**Q27/02 Quotation for Macroinvertebrate and Diatom
Monitoring**

Quotation Number Q27/02

**Water Catchments Team
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Contact Person:	Quotation Closing:
Peter Coad Tel: 02 98476965	Wednesday, 3.30pm 21st August, 2002

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2 Background

Hornsby Shire Council has been monitoring water quality since October 1994. This program was established as a commitment to the Statement of Joint Intent (Community Contract) for Berowra Creek in order to measure long term water quality trends as well as the impact of catchment activities and remediation devices.

In response to changing ecological information Council is seeking to engage in the monitoring of biological parameters, namely macroinvertebrates and diatoms.

3 The Study Area

The Hornsby Shire is located approximately 25 kilometres north west of Sydney and extends from Epping in the south to Wisemans Ferry in the North and Dural in the west. The study area is the land that is under the jurisdiction of Hornsby Shire Council. The total study area is 510 km². The major land use in the Shire (67% - 342.9km²) is bushland. Rural land uses constitute 101.2km² (20%) of the total area of the Shire. The remaining 13% is a mixture of developed urban, developing urban, light industrial and commercial land uses.

The Shire is naturally divided into four catchments which are the Berowra Creek Catchment, the Lane Cove River Catchment, the Cowan Creek Catchment and the Hawkesbury River Catchment.

All sites to be monitored as part of this program are located within freshwater creeks.

4 Objectives

The Environmental Monitoring Program has been designed to provide consistent and detailed information on the ecology of selected catchments within the Hornsby Shire. This information will monitor the effectiveness of land and water management and be used to justify policy initiatives aimed at improving the aquatic environment.

The program utilises a referential approach for assessment of biotic indices, where sampling site condition is assessed relative to the expected 'natural condition' of that site. Natural condition is defined by measurements collected from reference creeks, devoid of direct anthropogenic disturbance. In addition, comparison will be made with agreed National guidelines (ANZECC, 2000).

Specifically, monitoring of macroinvertebrates and diatoms is to address objective 4.2 and 4.4. Other objectives are included for the contractors information.

4.1 Eutrophication

- To monitor the water quality and aquatic ecology of the Berowra Estuary and associated catchments in relation to efforts to ameliorate algal blooms.

4.2 State of Environment Reporting

- To provide residents of the Shire with timely and accurate information on the status of waterways within the Hornsby Shire.

- To monitor and report on aquatic ecosystem health within Hornsby Shire in accordance with the ANZECC (2000) guidelines.

4.3 Performance monitoring of Catchment remediation devices

- To monitor the performance of structures (eg wetlands) designed for the purpose of catchment remediation, to improve design and maintenance of such devices.
- To monitor new technologies and ecological methods for stormwater reuse.

4.4 Leachate and Industrial contamination

- To determine whether leachate and industrial contaminants are having acute or chronic toxic effects on aquatic organisms or limiting water use.

4.5 Safe known recreational areas

- To monitor recreational swimming areas for contamination, from sewage, animal wastes, or other degrading factors which might render the water unsuitable for recreational use.

Specifically the macroinvertebrate and diatom monitoring aims to detect change within a catchment and to provide a reporting mechanism on the state of the health of the catchment's aquatic ecosystems. It is envisaged this program will continue for at least six years with annual reviews.

5 Site selection

The focus of the monitoring program is on sites at risk, where water quality and biotic indicator characteristics are influenced predominately by anthropogenic disturbances. Sampling sites have been selected in accordance with the programs objectives, statistical considerations and in terms of being representative of the identified catchment landuse. Except in the cases of sampling sites established to monitor point source discharges, monitoring sites are predominately 'mixed zones' (eg, riffles, pools, reaches).

For the purposes of sampling macroinvertebrates, a site is defined as a 100m reach whereby samples collected from a site are assumed to represent the fauna of the edge and riffle habitats within the entire reach. A riffle habitat is defined as an area of broken water with rapid current that has some cobble or boulder substratum whilst an edge habitat is defined as an area along the creek bank with little or no current (Turak & Waddell, 2001).

These sites and locations are negotiable with the Contractor and are provided as an indication of the size and number of samples anticipated as being required in meeting program objectives. Consultation with the client representative, involving fieldwork, will be required to establish the final list of sites to be monitored, this will be done once the successful tenderer has been identified

Note; two sites are monitored as part of the Lane Cove River Stormwater Management Plan Site 8- Devlins Creek, Cheltenham and Site- 46 Terrys Creek, Nth Epping. Whilst this program is in existence these sites will not be monitored as part of this contract.

- Table 1 Sites to be monitored

Site #	Description	Access	UBD Ref
1	Berowra Creek, Galston Gorge	2WD	Map 112 Q15
2	Tunks Creek, Galston Gorge	2WD	Map 112 Q16
4	Berowra Creek, Westleigh	2WD	Map 152 L3
5	Pyes Creek, Cherrybrook	2WD	Map 151 Q6
6	Georges Creek, Dural	2WD	Map 151 P4
10	Larool Creek, Thornleigh	2WD	Map 153 B9
12	Hornsby Creek, Hornsby	2WD	Map133 M14
13	Sams Creek, Mt Kuring-gai	2WD	Map 114 E5
36	Murray Anderson Creek, off Smiths Creek	Boat	NA
37	Smugglers Creek, off Marramarra Creek	Boat or 4WD	NA
39	Joe Crafts Creek, above confluence with Berowra Creek	Boat	NA
42	Colah Creek, Glenorie	2WD	Map 91 K15
45	Berowra Creek, at Fishponds Waterhole	2WD	Map 133 B12
49	Still Creek, Galston	2WD	Map 112 H3
62	Cowan township	4WD	Access via Quarry
63	Colah Creek Ben Bullen Road	4WD	Map 91 M5 (access via 4WD trail)
64	Galston Village Site	2WD	Map 111 M7
77	Gleeson Creek, Mt Colah	2WD	Map 114 A12
80	Glenorie Creek, Glenorie	2WD	Map 91 C3

6 Frequency

Macroinvertebrates

Macroinvertebrate sampling is to be done in accordance with the AUSRIVAS protocols for NSW (Turak & Waddell, 2001). Spring sampling will only be undertaken as comparisons between seasons is not considered necessary given the program objectives.

Spring is defined as September 15th until December 15th within any calendar year. To reduce the variability of the macroinvertebrate results, 3 replicate samples will be taken at each site with a minimal interval of one week between each sampling event.

6.1 Diatoms

Diatoms will be monitored every quarter to account for seasonal variations. This frequency will occur for at least two years. Depending on the results obtained this frequency may be reduced to biannually with more spatial replication. Alteration of the diatom sampling frequency will be negotiated with the Contractor.

Summer sampling is to occur during January. Autumn sampling is to occur during April. Winter sampling is to occur during July. Spring sampling is to occur during October.

6.2 Weather considerations

Sampling is to occur during low flow and dry weather only. A dry period is defined as rainfall not exceeding 10ml in each of the preceding 5 days prior to sampling. Rainfall stations to be monitored are operated by the Bureau of Meteorology at Glenorie, West Pennant Hills, Epping and Berowra. This information can be accessed via the Bureau's website (http://www.bom.gov.au/hydro/flood/nsw/sydney_metro.shtml)

7 Site Procedure

All sites are to be approached from the downstream direction, to avoid disturbing the waters that are to be sampled. Staff must be adequately trained in all aspects of field sampling and Occupational Health and Safety Requirements.

All bottles must remain sealed until the sample site has been reached.

Order of sample collection;

- 1) Water samples (alkalinity only)
- 2) Probe measurements which includes, pH, conductivity, turbidity, dissolved oxygen (mg/l and %sat), temperature and salinity.
- 3) Diatoms
- 4) Macroinvertebrates

It is important to collect the water samples and diatom samples from areas undisturbed from macroinvertebrate kick sampling.

As diatoms are minute, ubiquitous, and their frustules (shells) are resistant to decay, it is very easy to contaminate samples with either living or dead diatoms from elsewhere. Therefore all sample containers, hands, sampling gear, containers (including preservative dispensers that have been dipped into previous samples are to be thoroughly cleaned prior to usage.

In addition, the same procedures are relevant for macroinvertebrate monitoring. Wash nets, buckets and sorting equipment must be thoroughly cleaned prior to usage to prevent transfer of pathogens between creeks.

Procedures for the prevention of contamination are to be submitted with this contract.

8 Field Data Sheets

Field data sheets are to be developed and provided by the contractor. These field sheets must address the requirements of the contract and outline additional information as seen required to fulfill the objectives of monitoring macroinvertebrates and diatoms.

Field data sheets are completed following the procedure below.

- Sampling points are located by GPS reading
- A separate sheet is to be used for each sampling site.

- Insert the names of the samplers, date, time of sample collection, site number, sample code and split (if required).
- When all samples, measurements and observations are completed, the field data sheet must be signed by a staff member who is undertaking the sampling.

These field data sheets are to be submitted as part of this contract.

9 Water quality monitoring

9.1 Coordination with Hornsby Councils Water quality monitoring

Parameters monitored by Hornsby Shire Council at each of the sites include pH, Conductivity, Turbidity, Dissolved Oxygen, Temperature, Salinity, Nutrients (TN, NOX, NH₃, TP) and Suspended Solids. It is requested that co-ordination be made between the contractor and Hornsby Shire Council to ensure that diatom sampling occurs when Council is collecting physical and chemical samples in each quarter. Similarly it is requested that co-ordination be made between the contractor and Hornsby Shire Council to ensure that macroinvertebrate sampling occurs at least once when Council is collecting physical and chemical samples in the spring sampling period.

9.2 Collection of samples for alkalinity

The procedures used by the Water Catchments Team are based on AS 2031.1 (1986) Selection of containers and preservation of water samples for chemical and microbiological analysis (Part 1 Chemical) as well as Standard Methods for the Analysis of Water and Wastewater (APHA, 1998).

The procedure for the collection and preservation of samples is detailed below:

- Sampling points are located by GPS reading
- Advise Contract Laboratory at least 24 hours prior to sampling that samples will be delivered on the day of sample collection
- Gloves are to be worn, at the field teams discretion, at sampling sites to protect staff from contamination;
- A field data sheet is to be completed for each sampling site;
- Samples are to be taken from freshwater creeks from 0-10 cm depth. Samples are taken from mid stream. Sites sampled should avoid areas with excessive turbulence;
- Only new bottles are to be used. Bottles are supplied by the contract Laboratory. The bottle is opened at the site and the sample is collected. The polyethylene bottles are rinsed twice and then filled to the top with the sample.
- Following the collection of alkalinity samples multiprobe parameters are to be recorded.
- Once bottles are filled place them immediately on ice or in a portable fridge to preserve the sample as no preservatives are used in this sampling program. The samples are kept cold (>1⁰C and <5⁰C) and not frozen.
- Each sample is recorded so that identification of each bottle is obvious. The bottles are individually labelled with the date, time, sample code and appropriate test to be

conducted written on waterproof labels using a waterproof pen. The sample code is also written on the glass/plastic and lid of each bottle with waterproof felt pen.

- Custody of samples is the responsibility of the Contractor.
- Alkalinity samples are to be submitted to a NATA registered Laboratory at the end of each sampling day within 12 hours of collection.

Details of the NATA registered Laboratory that will be utilised by the contractor must be supplied as part of this contract.

9.3 Probe measurements

Probe measurements are to be collected with a calibrated probe (refer to section 13.5). Probe parameters to be recorded include; pH, conductivity, turbidity, dissolved oxygen (mg/l and %saturation), temperature and salinity.

When collecting measurements it is essential that the most variable parameter has stabilised prior to recording the first reading. Two sets of readings are to be taken to ensure probe readings are relatively stable.

As an indicative list other visual parameters to be reported include (NB, additional information as required by the contractor can also be included):

- Sampling points are located by GPS reading
- Weather conditions to describe the prevailing weather at time of sampling.
- Wet/Dry: a wet weather event is described as greater than 10mm of rain in the previous 24hours and a significant increase in the flow in the creek.
- Nuisance organisms: describes whether there are any nuisances present at the site such as algal mats/blooms, ducks.
- Oily films
- Odours
- Frothing
- Colour/appearance of water
- Flow, If flow measurements are collected at the site record the width and depth and velocity spaces.

When all samples and measurements are taken and observations completed, sign the field data sheet must be signed.

10 Diatom Collection and Preservation

The following procedure is adapted from Chessman, *et al*, 1999 and has been selected and adapted by Hornsby Shire Council to meet the objectives of the monitoring program.

10.1 Substrate Selection

At each site, where possible, a sample should be collected from a hard surface. Where a hard surface does not exist the sample may be collected from mud/detritus. Preference is given to hard surface sampling as they are the most consistently collected, faster to analyse and less likely to be contaminated with dead cells than the mud/detritus samples.

10.2 Hard Surface Samples

The most preferable substrate is a rock that is big enough to have remained stable under most flows, yet small enough to be picked out of the water (eg approximately 10-30cm diameter). If there are not the right sized rocks, use larger or smaller ones. If there are no rocks, then the preferred substrates are logs, other woody debris, and macrophytes (in that order). The type of substrate is to be recorded.

Wherever possible, these samples should be from the riffle or run sections of the streams. It is preferable to sample near the middle of the stream. The sample should be a composite of scrapings from three rocks (or logs, etc) at the site, with each individual substrate being at least 1m apart from the others being sampled.

Diatoms are collected from the hard surface by scraping with a blade (eg from a pocket knife or from a stick, such as a sharpened ice-cream stick. Should a pocket knife be used it must be washed thoroughly between sites, whilst only new ice-cream sticks should be used for each site.

When scraping the rock surface only those sides that are exposed to light when it was in the stream should be scraped (ie. The top or side of the rock). Also it is preferable to scrape an area that does not have other growths (such as moss, lichen, or filamentous algae). Sometimes the options may be limited and compromise will be needed. If there is detritus on the rock (or other substrate), the sample may actually be part of the "soft surface" community as well as the "hard surface" community. To avoid this contamination of the hard surface sample, shake any hard surfaces (under the water) prior to sampling. For consistency, a vigorous shake for 3 seconds is recommended.

It is preferable to sample from substrate that is submerged to approximately 15cm depth. This measure is also selected purely for maintaining consistency. If the substrate near the middle of the stream is deeper than this, then deeper is fine. There are two exceptions:

- If the substrate is too deep to sample near the middle, then sample where practical
- If the water is too turbid to see the bottom of the stream in the middle, then keep to the 15cm rule.

If the stream has no riffles or runs then slow flowing sections are all that can be sampled.

10.3 Mud/ Detritus

Wherever possible these should be from the edge of a pool or a protected area (such as behind a large rock or log). The sample may be collected either by dipping a tea-spoon into the detritus layer or by using a pipette. When using a pipette, the sample is simply taken by pressing the bulb of the pipette, then gradually releasing it whilst dragging the nozzle over the surface of the detritus. This should be done at three locations in the stream reach. These three locations may be all within one metre of each other, or they may be on opposite sides of the stream- depending on what is available. If a tea-spoon is used, it should be washed thoroughly between sites. When pipettes are used, a new pipette should be used for each site (plastic disposables).

The preferred depth of sampling is 5 cm - again this is just for consistency and more shallow is preferable to deeper.

Two important points to keep in mind when selecting sample points are:

- The soft-substratum sampling should be done at a point in the stream that has been inundated for several weeks. In streams where the water depth fluctuates considerably, it is better to sample a little deeper if this means that the sample point is more likely to have been inundated for the required length of time; and
- Although quiet sections of the stream may offer the most suitable habitat for detritus accumulation, diatom assemblages from areas that do not have substantial movement of water over them may reflect the internal nutrient dynamics of those areas rather than the water quality of the main stream. Therefore, isolated pools or backwaters without significant streamflow should not be sampled as stream assessment sites.

As for the hard-surface samples, if there is not a suitable place to sample, then there cannot be a sample from that site.

10.4 Sample preservation

It is unclear as to what is the best method for the preservation of the diatoms and whether the frustules dissolve in the various preservatives. Preservatives most commonly used are ethanol (approx 70%) and Lugols iodine solution.

Procedures and materials used in preserving diatom samples must be submitted with this contract.

10.5 Laboratory Methods for Diatom analysis

Processing of diatom samples will involve the following steps. Amendments to this procedure are to be submitted as part of this contract.

Wash the sample into a beaker using distilled water. This is then allowed to settle allowing at least one hour for each centimetre of water depth in the beaker. After settling, the supernatant must be removed, leaving the sedimented diatoms (and other particulates). The sediment is then washed into a test tube, and again allowed to settle for at least one hour per centimetre of water depth in the test tube. For neither of the settling periods should the diatoms be left longer than a day. This is to ensure minimum dissolution of the silica from the frustules.

At this stage, a scan of the material on a light microscope should be undertaken, and a record made of the approximate percentages of the most common taxa. A note should be made of the numbers of each taxa with organelles (i.e. alive at the time of sampling) versus those without organelles. The results of this scan should be compared with the count of the cleared frustules.

Clearing of the frustules requires the removal of the supernatant from the test tube after the diatoms have settled. The addition of hydrogen peroxide, as required, to the sediment in the test tube, and the placement of the test tube in a water bath at approximately 60-80° C. Two hours is quoted as the usual amount of time required for the removal of the organic matter from the frustules, although it may in fact take more than a day.

When clearing the frustules, it is important to keep watch on the test tubes in the water bath, especially for the first half hour. This is because reaction of the hydrogen peroxide on the organic matter may be vigorous, and the mixture may overflow. If the mixture does appear to be about to overflow, the test tube should be removed from the water bath, and

the water bath set at a lower temperature for the clearing process. Clearing is complete when effervescence ceases.

Following clearing, the material is again allowed to settle. The supernatant hydrogen peroxide is removed, and the sediment is resuspended in high grade ethanol. This process should be repeated twice, and after the final rinse in ethanol, the sediment can be stored in a vial, ready for mounting. The Diatoms are then to be counted under microscopic examination.

11 Macroinvertebrate Collection and Preservation

Macroinvertebrate sampling is based on the procedures in accordance with the NSW AUSRIVAS Sampling and Processing Manual, July 2001 (Turak and Waddell, 2001). The information following is extracted from these procedures.

In addition, an extension of the AUSRIVAS monitoring protocols is to be applied to incorporate the SIGNAL index (Chessman, 1995) and subsequent revisions. The SIGNAL index uses macroinvertebrate abundance and sensitivity grades whereas AUSRIVAS is an index based on presence/ absence and modelling.

11.1 Collection of Samples

All macroinvertebrate sampling is to be undertaken with a 0.25mm mesh size kick net. The net should be long enough not to cause backwash (60cm or more) and the net handle should be long enough (1.2m) to reach animals and microhabitats that are not immediately near the operator. Nets should be rinsed well prior to each sampling occasion to ensure no animals are collected from another habitat or remain stuck in the net.

11.2 Riffle Sampling

The downstream end of the riffle zone is located within the site and at this point sampling begins. The substratum is disturbed with the feet whilst holding the net downstream with the mouth facing upstream. The substratum is vigorously agitated by digging your feet well into cobbles and boulders. If required, turn and rub the boulders and cobbles by hand to dislodge organisms. The process is continued, moving upstream over a total distance of 10 metres comprising any number of discrete segments. Sampling should be conducted in both the fastest and slowest flowing sections of the riffle and at a maximum possible range of depths. Note, periodic rinsing of the net into a bucket may be required to remove fine particles that can block the flow of water through the net which can cause backwash and loss of captured macroinvertebrates. Once all the sample has been collected the entire sample can be rinsed again to remove fine particles that may obscure the animals present. On completion of the sampling the sampling net should be thoroughly rinsed.

11.3 Edge Sampling

The net is to be swept over a total bank length of 10 metres comprising any number of 'discrete segments' (areas identified as being individually separate/ representative of creek habitats). Use sequential short sweeping movements at right angles to the bank. The substratum should also be disturbed, such that benthic animals are suspended and then caught when sweeping through the cloud of suspended material. Surface dwelling insects (such as water striders and whirligig beetles) are also to be collected. Note, Water striders (family *Gerridae*) are difficult to catch, however, if they have been observed a note must be placed on the field sheet and also writing a note "Gerridae" and placing it within the sample for the edge habitat.

When the edge habitat is being sampled, as many different instream 'structures' are to be sampled such as tree roots, trailing bank vegetation, under overhanging banks and along logs if present. However, do not work into log crevices or use your hands or any other means other than the net to extract animals. Macrophytes can be included in the edge habitat and should be sampled if abundant, however, small patches of macrophytes should not be deliberately sought for while sampling. As mentioned for riffle sampling, once all the sample has been collected the entire sample can be rinsed again to remove fine particles that may obscure the animals present. On completion of the sampling the sampling net should be thoroughly rinsed.

11.4 Macroinvertebrate sample processing

A live-pick sorting procedure is used. Samples are to be sorted as soon as possible after collection. **Edge and riffle samples are to be processed separately.** Sorting is to be conducted close to the site and during daylight hours. If this is not possible the contents of the net sampling should be transferred into a labelled container or bag and kept cool and moist with some water.

The aim of the live sorting procedure is to pick as many macroinvertebrate taxa from the sample as possible. Standardisation of picking effort and performance during the live picking procedure is achieved by meeting criteria regarding a combination of sorting time and the number of animals picked.

11.5 Guidelines for the live-pick procedure

- Contents of the net are emptied into a sorting tray and picked progressively through the sample using forceps and/ or pipette. Rinse the net to remove all material and check for remaining animals. Ensure no animals are lost from the sample by jumping or crawling out of the tray. If fine clay particles are clouding the sample in the tray it may be more efficient to sort through a portion of this material at a time using a number of different sorting trays. All material is to be examined at least once in the first 30 minutes;
- For the first 5 minutes, collect the active, common taxa while trying to avoid being biased towards the larger more colourful animals;
- For the next 20minutes, concentrate on getting new taxa;
- If by 25 minutes no new taxa are found, concentrate on getting more animals for the next 5 minutes;
- Place picked animals into a labelled jar of 70% ethanol (with 2% glycerol). Snails should be placed live into a separate sampling jar in clear water. Labels should contain site code, location, sampling date, habitat sampled and the name of the collector and sorter. Labels should then be placed inside the jar if possible;
- Use a hand held counter to keep a record of the number of animals collected;
- Actively search for cryptic and/or small taxa;
- Attempt to pick at least 20 *Chironomids* to ensure that an adequate representation of all subfamilies is obtained; and
- Check the bottom of the tray while discarding the residue to ensure no new taxa are present. New taxa commonly found stuck to the tray include flat worms, water pennies, leeches, freshwater limpets and other gastropods. Any new taxa found at this stage should be added to the live-pick sample.

11.6 Criteria regarding sorting time and the number of animals

- The minimum picking period is 30 minutes;
- At 30 minutes, if the number of animals collected exceeds 200 animals then picking should stop. If 200 animals have not been collected then picking continues;
- At 40 minutes if no new taxa are found within the last 10 minutes or 200 animals have been collected, picking concludes. If new taxa were found in the last 10 minutes and 200 animals have not been collected then picking continues; and
- At 50 minutes if no new taxa have been found within the last 10 minutes or 200 animals have been collected, picking concludes. If new taxa were found, picking should continue until 200 animals have been collected or 60 minutes has elapsed.

12 Taxonomic resolution

Macroinvertebrate and Diatom samples need to be identified to genus level utilising the latest available taxonomic keys. Macroinvertebrates unable to be identified to this resolution are to be noted in the submission. Quotes for family level identification only should be included in the current quotation. Species level identification is to be undertaken for species considered rare and endangered. Such species include *Archaeophyla adamsi*, *Illeoperia sp6* and *Wheeneyella sp 1*. All macroinvertebrates should be identified using the taxonomic keys listed in Hawking (2000).

Details of macroinvertebrate and diatom identification must be supplied to Hornsby Shire Council. These details must include levels of magnification used on microscopes, staff training and any other quality control procedures.

13 Quality Assurance and Quality Control

13.1 AS/NZS ISO 9002

It is preferred that the contractor has a management system that complies with the requirements of AS/NZS ISO 9001:1994, "Quality Systems – Model for quality assurance in design, development, production, installation and servicing". If the contractor does not have this system, then details of an equivalent quality system should be included with the submission of quotation.

13.2 Field supervision

Periodically staff from the Water Catchments Team will attend field sampling days to ensure work is being carried out in accordance with set procedures.

13.3 Diatom and Macroinvertebrate cross checks

Periodically staff from the Water Catchments Team will collect duplicate samples of diatoms. Macroinvertebrate samples collected will randomly be cross checked by staff also.

Upon the completion of identification and quality assessment of randomly selected samples, all samples will be returned to 70% ethanol for long-term archiving at Hornsby Council. This process will allow samples to be re-examined at a later date if required (eg due to taxonomy changes, etc.)

In responding to this contract details of contractors procedures for internal quality assurance of taxonomy is required (eg. procedure when a specimen is unable to be identified, internal cross checks to ensure against operator error, taxonomic training programs for staff, etc.). Also, details of storage and labelling are also requested.

13.4 Alkalinity

Laboratory analysis for alkalinity is to be undertaken by a laboratory that is NATA accredited. Specifically the laboratory is to be accredited by NATA for technical competence for chemical and biological testing.

13.5 Probe Calibration

As a requirement of Council's quality system (ISO 14000/ISO9002) any probe that is used for monitoring purposes must be calibrated in the morning prior to sampling. A calibration check must also be performed at the end of the sampling day when all samples have been collected.

Parameters to be monitored utilising field probes include, pH, Conductivity, turbidity, Dissolved oxygen (mg/l and %saturation), temperature and salinity. Standard solutions must be used in accordance with specifications set by the manufacturer of the probe.

Details of probe calibration procedures must be submitted in responding to this contract

13.6 Cleaning of equipment

As previously cited, all equipment must be cleaned at the end of each sampling to ensure there is no contamination of future samples and to ensure there is no transport of pathogens between sites.

14 Reporting

Hornsby Shire Council will be reporting on outcomes from this monitoring within its Annual Water Monitoring Program Report. The audience for this report is the residents of Hornsby Shire, Councillors and government agencies. Subsequently, the report must be easy to read and understandable to members of the community who do not have scientific knowledge.

14.1 Final report

The final report should include;

- Executive summary
- Methods (including methods in calculating indices)
- Indices used and results
- QA/QC methods used throughout the survey.
- Results and statistical interpretation

- This must include presentation of data on maps such as AUSRIVAS outputs.

- Future recommendations and the use of this information in assessing landuse impacts in the Shire
- Management implications

14.2 Quarterly Progress reports

Progress reports are to be submitted each quarter. This report must outline results to date, budget expenditure and forecast for the following quarter and any issues that have arisen in regard to OH&S, sampling methodology, etc. Three progress quarterly reports will be submitted with the last quarter report being the final report.

14.3 Data Analysis

Multivariate and univariate data analysis techniques are to be used (as appropriate) to assess spatial and temporal interactions and the influence of the surrounding landuse types. Other techniques such as biplots are also to be utilised. The relationships between environmental variables and the biotic communities should be determined.

The use of the biological indices should also be used. Specifically, and as deemed appropriate, SIGNAL, AUSRIVAS and EPT will be used for macroinvertebrates. The use of predictive models for diatoms should also be considered. Tenderers must provide methodologies, detailing the indices that will be used to assess biological condition. AUSRIVAS and SIGNAL value calculations are considered mandatory. A map of the AUSRIVAS outputs is to be provided in accordance with formats outlined by Environment Australia (Gray, 2001).

The successful tenderer will also be required to review the success of the monitoring program and suggest future long-term monitoring requirements. As the program requires an analysis of long term changes and trends, the tenderer must describe the statistical methods that can be used to detect long-term trends in the data, and whether the current monitoring program collects data suitable for such analysis. The review of the suitability of the monitoring program will also include an assessment of the need for species level identification and the adequacy of the number of sites chosen.

14.4 Format

Results are to be provided in two formats;

14.4.1 Hard Copy

This is to be delivered via post. Each page must have the contractors logo, within either the header or footer. A cover page is required with a signed statement from the Contractors Principal Scientist, ensuring the quality of the data being reported upon.

Six draft copies of the final report are required for review and comment. Following review and amendment of the report, if necessary, and obtaining approval to print, 20 copies of the final report are to be printed and presented to Council two weeks prior to the end of the financial year.

In addition, supply of internal QA/QC undertaken during the processing and analysis of macroinvertebrate and diatom samples must also be provided (eg internal cross checks, inter-operator comparisons, etc).

All field sheets must be supplied with relevant signatures from the supervising field officer.

14.4.2 Geographic Information System (GIS) requirements

To ensure all data is able to be integrated into Hornsby Shire Councils GIS, the following format is to be applied to all samples collected. All coordinates are to be provided in the utm/ups position format and use map datum WGS84 or GDA94. Using this format all 'X' coordinates are to be 6 digits and all 'Y' coordinates are to be 7 digits in length (refer to table-2).

All maps provided as part of the monitoring program are to be provided in a format suitable for integration into Mapinfo V 7.0. It is preferred to receive maps as portable network graphic (.png). If this is unavailable then other format options for submitting maps include as metafiles (.wmf and .emf) and as bitmaps (.bmp). No other formats will be accepted.

14.4.3 Electronic Copy

An electronic copy of the results and field investigations must be provided via email to pcoad@hornsby.nsw.gov.au. Final assembled reports are to be provided electronically to Council in both pdf format and Microsoft Word suitable for Adobe V4.0 and Windows NT V4.0 operating systems respectively. All raw data is to be supplied in a format suitable for Excel 2000 or Access 2000.

The format for this data must be organised with analytes or organisms as columns and samples as rows, all rows must contain the representative GIS projections and map datum an example is provided below. All results within the cells must be expressed as a single date/word/number (except in the header row). All measurement units for analytes must be provided.

- Table 2 Example of data organisation

GIS Coordinate X	GIS Coordinate Y	SITE ID	DATE	FAECAL COLIFORMS (org/100ml)	NOX (mg/l)	TOTAL NITROGEN (mg/l)	Species 1
323 688	6 269 405	49	4/06/2002	3	0.12	0.39	1
333 705	6 346 789	18	4/06/2002	1	5.00	49.0	45
222 567	6 789 034	42	4/06/2002	52	0.05	0.36	1

Additional to this, Council will place reports on the website and also upon a CD. This will be done at Councils' expense.

15 Payment for Services

Progress payments will be organised on a quarterly basis with the successful contractor to issue Council a tax invoice within 20 working days of the quarter end. Payment will also be subject to the lodgement of a quarterly report. No quarterly payment will be made until the reports have been received and accepted by the principal. The tax invoice should have a clear breakdown for all items of service charged. The final payment for each financial year will only be made on invoices received prior to July 11th.

16 Occupational Health and Safety

Risk Management Determination (OHS04) specifies the Council requirement for formally documented risk assessments to be undertaken. This process of risk management

requires that workplace hazards be identified, assessed, controlled and reviewed. From an occupational health and safety perspective, risk management is the process of recognising situations which have the potential to cause harm to people or property, and then doing something to prevent the hazardous situation occurring, or the person being harmed.

This is a requirement of the Occupational Health and Safety Act (2000) and the Occupational Health and Safety Regulation (2001). The contractor is required to observe all statutory/regulatory safety requirements and to provide for the protection of persons and property as part of the Contract. While working on Hornsby Shire Council's premises and/ or work sites the contractor shall also comply with all of Hornsby Shire Council's Occupational Health and Safety determinations and procedures. In addition, to this the contractor must comply with instructions and directions given by the Principal.

The Contractor shall, at all times exercise any other necessary and reasonable precautions appropriate to the nature of the work and the conditions under which the Contract is to be performed for the safety of all persons involved in or affected by that work.

Details of contractors/sub-contractors Occupational Health and Safety Procedures/Plans should also be submitted with the quotation, including documented risk assessment and safe work method statements which identify potential hazards and risk minimisation controls.

16.1 Documented risk assessment and safe work method statement

The Contractor shall prepare and submit a 'Documented risk assessment and safe work method statement' ("the statement"), for review and formal acceptance from the Principal prior to the commencement of work on site.

The Contractor shall implement the statement and carry out frequent workplace inspections to ensure that OH&S controls are in place, systems are implemented, OH&S risks are identified and promptly addressed.

In consultation with the Principal, the contractor shall take all reasonable steps to accommodate the safe work of any other persons or contractors on the site.

The Contractor shall take appropriate measures to ensure the statement is kept relevant to the carrying out of the work under the Contract.

The Contractor shall submit to the Principal any revisions to the Statement and shall ensure that the Contractor's employees and subcontractors follow the requirements of the statement.

The Contractor shall promptly advise the Principal in writing of all accidents involving loss of time or incidents with serious accident potential, and provide such relevant information as may reasonably be required to the Principal.

The general requirements of the statement are outlined

16.1.1 Management responsibility

The Contractor's statement shall state the name of the Contractor's management representative/s responsible for the following.

- Overall on site compliance to OH&S legislation
- Reviewing sub contractors' statements

- Monitoring subcontractors statements
- Receiving, safely storing and using material and hazardous substances
- Communicating OH&S information and site safety rules
- Maintaining accident and emergency procedures and first aid equipment
- Identifying, assessing and controlling hazards

16.1.2 Safe Work Method Statements (SWMS)

Minimum requirements of SWMS have been established to ensure compliance with Council’s Occupational Health and Safety Management System. These requirements include;

- The wording “Safe Work Method Statement” in its title.
- A clearly marked document reference number.
- The date the SWMS was completed.
- The name of the person/s completing the SWMS.
- The signature of the person/s completing the SWMS.
- The name of the person/s responsible for ensuring the SWMS is followed and/or the appropriate control strategies implemented.
- A description of the work the SWMS is written for.
- The step-by-step sequence to be followed to complete the work task.
- Whether the SWMS requires review. If the SWMS does require review a date for review must be indicated.

A proforma outline for a Work Method statement is placed at the end of this contract. For the purpose of consistency, the following Hazards have been identified and must be addressed within the SWMS

- Table 3 Key Hazards associated with provision of services

Activity	Hazards
4WDDriving	E.g. Driver fatigue, Water crossings, Vehicle stranded in remote locations
Working in Isolated regions	E.g. Stranded in catchment, Risk of medical emergencies, Isolation
Macroinvertebrate and Diatom sampling	E.g. Working near water, Animal bites, Potential for bushfires, Water boume diseases, Heat/exposure, Slip/trip/fall, Chemicals used for sampling
Laboratory procedures	E.g. Chemicals, RSI

16.1.3 Additional safety requirements

The statement shall also incorporate as a minimum the following requirements for the provision of services;

- The contractor shall provide and maintain for its employees and sub-contractors appropriate protective clothing and personal protective equipment (PPE) for protection against exposure to weather, ground conditions, attack by fauna, hazardous substances, noise and other identified hazards relevant to the provision of services.
- Field sampling teams operating in remote or isolated locations shall consist of a minimum of 2 persons
- All staff engaged in the sampling of, or in contact with, sewage- type contaminants shall be inoculated against Hepatitis A, Hepatitis B, Tetanus and Poliomyelitis and such inoculations shall be kept up-to-date for the period of the Contract.
- All field sampling staff must hold current First Aid Certificates.
- Field sampling teams shall at all times carry a First Aid Kit and appropriate means of communication (satellite phone or two way radio)
- All staff working on, over or adjacent to water shall take appropriate precautions to prevent drowning.
- All boats shall be equipped with a life jacket for each occupant and must be worn at all times when on the boat and follow the Waterways Authority safe boating procedures.
- All drivers of boats must be licensed.

16.2 Workplace Incident and Accident Reports and Hazard Report Forms

The Contractor shall immediately notify the Principal of any serious workplace incident/ accident or hazard. The Contractor shall notify the Principal, who will then instruct the contractor to complete either a 'Workplace accident/incident form' or 'Hazard report form'.

If requested, the Contractor shall supply a written report to the Principal in the form directed and shall co-operate in any subsequent incident investigation and/or debrief conducted by the Principal.

16.3 Hazard identification meeting

Following the award of the Contract, the Contractor shall meet or confer by telephone with the Principal to ensure that the significant Occupational Health and Safety hazards and risks associated with the Contract work have been identified. These shall include for those hazards identified in the Contractor's tendered 'Documented risk assessment and safe work method statement'.

16.4 Insurance requirements

The contractor must have current insurance cover in the following areas. Confirmation of the insurance cover is to be provided as part of the submission.

- Table 4 Insurance requirements

Insurance Type	Limit of liability
Public Liability Insurance	\$10 million
Professional Indemnity	\$1 million
Marine Insurance on hull (including protection and indemnity)*	\$1 million
Compulsory Motor Vehicle Insurance	\$10 million(Section 2 Legal Liability for Property Damage)
Workers Compensation	Certificate of currency

*If the contractor does not have a boat, then this is a requirement for the company in which a boat is hired from.

17 Conditions for Provision of Quotation

The conditions of engagement are as follows:

17.1 Corporate and Joint Venture Quotations

Two or more persons or corporations may lodge a joint venture quotation in which event they shall be jointly and severally bound by the Quotation and by the Contract under which their quotation is accepted, and shall be jointly entitled to the benefit of the Contract if their quotation is accepted.

17.2 Experience of Contractors

Quotations are invited by the Principal from Contractors who have had previous experience in providing Professional Services of a similar nature and duration, and which were satisfactorily completed.

17.3 Conditions of Engagement

If Council decides to accept a quotation, a Purchase order will be issued to the successful Contractor only after all necessary Insurance documentation is verified current and adequate by Council. Contractors appointed under this contract shall indicate acceptance of this contract in writing. This order and letter of acceptance will constitute a binding contract between the Council and the successful Contractor.

Hornsby Council reserves the right to terminate a contract if it is deemed by Council that the Contractor is unsatisfactory in accordance to the requirements of the Contract. Two weeks notice will be given by Council if this situation arises during the course of the Contract.

17.4 Partial engagement

The Principal reserves the right to assign partial engagement, should all quotations be beyond the budget for this monitoring program. Council will consider partial engagement to reduce cost. For example, the Principal may choose to undertake the collection of the organisms and utilise a contractor for subsequent identification and reporting. Opportunities identified for partial engagement and subsequent cost reduction can be identified as part of the contractors submission.

17.5 Length of engagement

The Contractor will be engaged on this project for a period of 3 years, subject to annual reviews. The Principal may terminate the whole or part of the performance of the Services at any time, by written notice addressed to the Contractor.

17.6 Contractors obligations

The contractor is to maintain a professional standard of care and perform all Services in a diligent manner and to a standard of skill and care expected of a contractor experienced in the provisions of the type of services required by the Principal in accordance with this Contract. In addition, the contractor must use all reasonable efforts to inform itself of the requirements of the Principal and must regularly consult with the Principal during the performance of the Services.

17.7 Alternative methodologies

The Contractor shall submit a conforming quotation. The Contractor may submit an alternative method to that previously defined for the carrying out of the Services. The procedure for, and the differences between, the method specified and the proposed alternative must be clearly outlined in the Quotation. The Contractor should also state why the alternative method is preferable and how it would benefit the Principal's requirements. Should the alternative methodologies be accepted by the Principal a new contract will be written and agreed to between the Principal and Contractor.

17.8 Confidentiality and Copyright

Investigations and reports generated by the Laboratory will remain confidential unless consented, or until released by Hornsby Shire Council. The ownership and copyright of any information and data supplied by the Contractor in regard to these works shall be vested in Hornsby Council. All intellectual property material generated as a result of this program shall vest with Hornsby Shire Council.

17.9 Goods and Services Tax, GST

All prices are to be quoted excluding GST, unless otherwise indicated. If the tenderer does not provide an Australian Business Number (ABN) indicating that the Tenderer will pay GST on any taxable supply made under the Contract, the tender price will be weighted by a 10% increase in the assessment of the Tender price relativity.

17.10 Submission

The submission shall be upon the contract provided, and shall be accompanied by any other documents required to be submitted with the quotation.

The following details shall be submitted with the quotation:

- Principal contact name and phone number.
- Details of previous similar work.
- Relevant experience of personnel who will be involved in the work.
- Details of all proposed sub-contractors.
- Details of NATA registered Laboratory to be used for Alkalinity testing.

- A Completed 'Standard quotation requirements' (Appendix-1)
- Signed Statuary Declaration. (Appendix-2)
- Confirm procedures as outlined within with supporting quotation. Amendments to these procedures as per section 17.7 should be identified and separately costed within the quotation for:
 - Site Procedure (including prevention of contamination)
 - Field data sheets and procedure for recording data
 - Water Quality monitoring procedure
 - Diatom Collection and Preservation
 - Macroinvertebrate Collection and Preservation
 - Quality Control and Quality Assurance procedures (for sampling, probe calibration, organism identification, taxonomic training, data entry and reporting)
 - Details of organism storage, transport and archiving
- Proposed opportunities for partial engagement or for Council involvement to assist in reducing cost. (Optional)
- Details for of alternate methodologies as instructed in section 17.7. (Optional)
- Quotation for family level identification and for genus level identification. Please indicate which organisms are able and unable to be identified to this resolution by your organisation.
- Details of Statistical methods to be used to detect long term trends, comparison with reference conditions, and correlations with surrounding landuse.
- Provide a "Documented Risk Assessment and safe work method statement" (Appendix-3)
- Confirmation of insurance cover as per table Table-4 "Insurance Requirements"

17.11 Lodgement Of Quotation

The Quotation Return Package should be submitted to Councils Tender Box (Ground Floor Reception) by 3:30pm on Wednesday 21st August, 2002. LATE SUBMISSIONS WILL NOT BE ACCEPTED.

Quote Return Packages should be clearly marked "**Q27/2002 - Quotation for Macroinvertebrate and Diatom Monitoring**" and addressed or delivered to:

THE TENDER BOX	
Postal address:	Or delivered to:
Ground Floor Reception	296 Pacific Highway
Hornsby Shire Council	HORNSBY NSW 2077
PO Box 37	
HORNSBY NSW 1630	

17.12 Informal Submissions

Any submission which does not comply with all the requirements of, or contains provisions not required or allowed by the quotation documents will be rejected.

17.13 Acceptance Of Quotations

The Principal shall not be bound to accept the lowest or any quotation. A quotation shall not be deemed to have been accepted until the Laboratory is notified in writing of such acceptance.

Assessment of submissions will be based on the following:

- Documented Risk Assessment and Safe Work Method Statement (Appendix-3);
- Appropriate NSW Fisheries, boat and NPWS licences for scientific work (mandatory);
- Tender price;
- Detailed methodology outlining any amendments or changes from those suggested within this contract;
- Detailed methodology of data handling and index calculations (including a list of supporting reference material);
- Demonstrated experience in and expertise in macroinvertebrate sampling, identification, index calculation and reporting;
- Qualifications, experience and relevant training of staff;
- Ability to meet proposed timeframe;
- Quality assurance systems and procedures, and,
- Demonstrated commitment to OH&S.

17.14 Sub Contractors

The Contractor shall submit in the space provided for the purpose on the Schedule, the name and full particulars regarding any Sub Contractor to whom they intend to sub-let any portion of the works. Failure to supply this information may result in the submission being rejected. The Principal reserves the right to approve or reject such listed sub-contractors or any proposed alterations.

17.15 Advice

The Principal will not be bound by oral advice and only upon written advice.

17.16 Quotation Validity Period

The quotation shall remain valid for a period of sixty (60) days, or such longer period accepted by the Laboratory.

17.17 Payments

Unless otherwise specified, provided or agreed to and subject to those conditions, the contractor will be progress paid based on completion of the work as agreed by the Environmental Scientist- Water Quality, Water Catchments. Final payment will not be made until the Manager, Water Catchments has certified that the Contractors obligations have been fulfilled.

Council reserves the right to recover any overpayment.

17.18 Final Statement

The Manager, Water Catchments may at the expiry of the completion of the Contract, direct the Contractor to submit a final statement (endorsed as such) of all claims to be made against Hornsby Shire Council.

If the Contractor fails to submit within 28 days a final statement, any claims which the Contractor should have made against Hornsby Shire Council and has not made shall be barred.

18 Timeframe

Due to the requirements of the Annual water quality report the final reporting of the macroinvertebrate and diatom sampling must be submitted by the 20th June of each calendar year.

- Table 5 Proposed timeframe

Activity	Date
Submissions received	21 st August
Engage successful contractor	29 th August, 2002
Confirm site selection	9 th September, 2002
Hazard meeting	12 th September, 2002
Sampling macroinvertebrate	15 th September-15 th December, 2002
Sampling Diatoms	October, 2002, Jan 2003, April, 2003
QA/QC crosschecks	Until April 2003
Final report	20 th June

19 Further enquiries

For further enquiries regarding the contract please contact:

PETER COAD
Environmental Scientist – Water Quality
 Water Catchments Team
 Environment Division
 PO Box-37
 HORNSBY NSW 1630
 PH: 02 9847-6965
 FAX: 02 9847-6598
 EMAIL: pcoad@hornsby.nsw.gov.au

AMANDA COLLINS
Occupational Health and Safety Officer
 Human Resources Branch
 Strategy Division
 PO Box-37
 HORNSBY NSW 1630
 PH: 02 9847-4853
 FAX: 02 9847-4862
 EMAIL: collinsa@hornsby.nsw.gov.au

20 Definitions

- **Principal:** means Hornsby Shire Council
- **Contract:** means this document
- **Risk Management:** The process of recognising situations which have the potential to cause harm to people or property, and then doing something to prevent the hazardous situation occurring or the person being harmed.
- **Hazard:** Anything that has the potential to cause injury or illness (to employees, contractors, visitors or the neighbouring public) or damage to property or plant. A hazard can be a physical item; e.g. a broken stair, or a work practice or procedure; e.g. working at heights without an appropriate fall arrest system.

Hazards can be divided in five categories;

1. **physical;** e.g. UV radiation, noise, light
 2. **chemical;** e.g. poisons
 3. **mechanical/electrical;** e.g. lifting boxes, machinery operations.
 4. **biological;** e.g. hepatitis A or B
 5. **psychological;** e.g. boring or repetitive work
- **Risk:** The likelihood of injury, illness or damage to property or plant from exposure to a hazard.
 - **Hazard Identification:** The process of identifying all situations or events that could give rise to the potential for injury, illness or damage to property or plant.
 - **Risk Assessment:** The process of determining the likelihood of an injury, illness or damage to property or plant occurring.
 - **Risk Control:** The process of implementing measures to reduce the risk arising from a hazard.

Risk controls can be categorised in a hierarchy. The hierarchy of control is;

1. **Elimination-** eg eliminate or design the hazard out;
2. **Substitution-** eg substitute that hazardous equipment or substance with alternate equipment or substance;
3. **Isolation-** eg enclose or distance personnel from the hazard;
4. **Engineering-** eg machine guarding, scaffolding;
5. **Administrative-** eg job rotation, housekeeping procedures, training, routine maintenance, safe work methods;
6. **Personal Protective Equipment (PPE)-** eg hearing protection, hard hats.

- **Safe Work Method Statement:** A step-by-step document identifying the steps required to complete a work task safely. Through the development of a Safe Work Method Statement (SWMS) each step of the task has been examined for potential hazards, identified hazards have been assessed and appropriate control strategies examined and implemented.

21 References

- ANZECC 2000. ***Australian and New Zealand guidelines for fresh and marine water quality Vol. 4.*** Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand.
- ANZECC 2000. ***Australian guidelines for water quality monitoring and reporting 2000 Vol. 7.*** Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand.
- APHA 1998. ***Standard Methods for the Examination of Water and Wastewater,*** 20th Edition, American Public Health Association, Washington USA.
- Chessman, B, Growns, I, Currey, J, Plunkett-Cole, N. 1999. ***Predicting Diatom Communities at the genus level for the rapid biological assessment of rivers.*** *Freshwater Biology*, 41, 317-331.
- Chessman, B., Gell, P., Newall, P. and Sonneman, J. 1999. ***Draft protocol for sampling and laboratory processing of diatoms for the monitoring and assessment of streams.*** In *An Illustrated Key to Common Diatom Genera from Southern Australia* (eds, P.Gell, J. Sonneman, M.Reid, M Illman and A. Sincock). Identification Guide No.26. Cooperative Research Centre for Freshwater Ecology, Albury, Australia.
- Chessman, B. 1995. ***Rapid assessment of rivers using macroinvertebrates: A procedure based on habitat-specific sampling, family level identification and a biotic index.*** *Australian Journal of Ecology* 20, 122-129.
- Gray, B. 2001. ***Mapping AUSRIVAS Scores.*** Environment Australia. (<http://www.ea.gov.au/water/rivers/nrhp/pubs/ausrivasscores.pdf>.)
- Hawking J.H. 2000. ***Key to Keys. A guide to keys and zoological information to identify invertebrates from Australian inland waters. Identification guide No. 2 2nd Edition.*** Cooperative Research Centre for Freshwater Ecology.
- Turak, E. and Waddell, N. 2001. ***New South Wales Australian River Assessment System (AUSRIVAS) sampling and processing manual.*** NSW Environment Protection Authority.
- Turak, E. and Waddell, N. 2000. ***NSW AUSRIVAS sampling and processing manual.*** NSW Environment Protection Authority and Natural Heritage Trust.

Appendix-1 Standard Quotation Requirements

ITEM	DESCRIPTION	DETAILS
1	Ability to provide water samples to a NATA accredited laboratory for analysis. Specifically, is the laboratory accredited by NATA for technical competence for chemical and biological testing.	YES / NO
2	Ability to supply both Boat and 4WD for undertaking field work as required.	YES / NO
3	Current ABN Number	_____
4	Ability to provide a final report by June 20 th of each calendar year.	YES / NO
5	Current AS/NZA ISO9001 "Quality Systems for design/development, production, installation and servicing." * If 'NO' please attach details of an equivalent quality system.	YES / NO*
6	Able to supply results in an electronic format suitable for Windows 2000 NT operating system.	YES / NO
7	Able to supply data with GIS coordinates in a format as specified (ie utm/ups for position format and WGS84 or GDA 94 map datum)	YES / NO
8	Able to supply raw data with analytes/organisms as columns and samples as rows, with all cells containing a single date/ word/ number (except in the header row)	YES / NO
9	Able to supply all invoices for payment within a given financial before July 10 th of the proceeding financial year	YES / NO
10	Able to provide a quarterly progress report prior to quarterly payment	YES / NO
11	Able to sample 3 replicate samples at 19 sites of macroinvertebrate communities in the period 1 st September to the 15 th December, 2002.	YES / NO
12	Cost involved in the analysis of macroinvertebrates for the suggested 19 sites Collection and sampling Identification to Genus (number of taxa _____) Identification to Family (number of taxa _____) Preservation and transport to Hornsby Council of organisms for archiving Data analysis and reporting	\$ _____ \$ _____ \$ _____ \$ _____ \$ _____
13	Cost involved in the analysis of Diatoms for the suggested 19 sites Collection and sampling Identification to Genus (number of taxa _____) Identification to Species (number of taxa _____) Preservation and transport to Hornsby Council of organisms for archiving Data analysis and reporting	\$ _____ \$ _____ \$ _____ \$ _____ \$ _____
14	Cost involved in the collection and analysis of water samples (i.e. alkalinity)	\$ _____
15	Cost per hour for variations or amendments required, as directed by the Principal.	\$ _____
16	Other _____	_____
Sub Total (excluding item 15)		\$ _____
GST		\$ _____
Total (including GST)		\$ _____

Name: _____

Position: _____

Signature: _____

Date: _____

Appendix 2 Statutory Declaration

I,

of

New South Wales, do solemnly and sincerely declare, in respect of the quotation for:

Any contract arising from the quotation, that:

- I hold the position of

.....

and am duly authorised by

.....

(The Contractor) to make this declaration on its behalf.

- Neither the Contractor nor any of its servants or agents had any knowledge of the price of any other Contractor prior to submitting its quotation nor has the Contractor or any of its servants or agents disclosed to any rival Contractor the price prior to the closing of the quotations.
- The Contractor submitted its quotation in good faith and has not deliberately set its quotation price above the level of rival Laboratories.
- As at the date of this declaration, the Contractor intends to do the work set out in the quotation documents.
- Neither the Contractor nor any of its servants or agents has entered into any contract, arrangement or understanding having the result that, in the event that it is successful, it will pay to any unsuccessful Contractor any moneys in respect of or in relation to the approved Contractor of any contract resulting there from.

Upon notification of acceptance of quotation by the principal, I accept both the general & specific conditions of contract as listed in council's quotation package document for the three year period starting 1st July, 2002 until 30th June, 2005.

And I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act, 1900.

Subscribed and declared on:

this day ofin the year of 2002

Signature:.....

Witness name:.....

Witness signature:.....

Appendix-3 Safe Work Method Statement**SAFE WORK METHOD STATEMENT 2**

Work Task/s:

Date Safe Work Method Statement
Completed:

Work Location and Details:

PERSON/S UNDERTAKING WORK TASK/S

1.
2.
3.4.
5.
6.

WORK TASK/S SUPERVISOR:

WORK STEP	HAZARDS IDENTIFIED	RISK LEVEL	CONTROLS TO BE IMPLEMENTED	PERSON RESPONSIBLE

TO DETERMINE THE RISK LEVEL OF A HAZARD, ASK YOURSELF:

1 How severely could it hurt someone

or

how ill could it make someone?

2 How likely is it to be that bad?

++

very likely
could happen
any time

+

likely
could happen
sometime

-

Unlikely
could happen,
but very rarely

--

very unlikely
could happen,
but probably
never will



kill or cause permanent disability or ill health

1

1

2

3



long term illness or serious injury

1

2

3

4



medical attention and several days off work

2

3

4

5



first aid needed

3

4

5

6

