Government of Western Australia
Department of Transport
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Generic Sediment Sampling and Analysis Scope

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Prepared for Department of Transport and Major Infrastructure (DTMI)

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Version control

Version No.	Date	Prepared by	Revision or issue descriptions	Issues to
Draft	10/04/2025	M P Rogers & Associates	Combined Draft for DoT review.	DoT
0	15/05/2025	M P Rogers & Associates	Updated with Client comments and issued for Client use.	DoT
1	19/06/2025	DoT	Additional updates from internal review	DTMI

Amendment record

This guidelines document is reviewed to ensure its continuing relevance to the systems and process that it describes. A record of contextual revisions is listed in the following table.

Page No.	Context	Revision	Date

Contents

Note

[Sediment sampling and analysis investigations are completed to provide a clear understanding of physical properties of sediment in a coastal area. This information is often used to assist with sediment origin, transport and modelling assessments, as well as for designing sand bypassing, dredging and nourishment works as part of coastal management. Capturing such data as part of a monitoring program would likely be completed at larger intervals such as 5 years, or when designing any dredging, bypassing or nourishment works.

If located in an area with possible contamination such as historical industry or asbestos shacks, further analysis for contaminants should be considered. Contaminant sampling is discussed to a high level in this scope, though likely requires additional consultation/consideration from suitably qualified sources.]

Formatting Key

[Throughout this template three text colours have been used to distinguish between the following items.]

1. Recommended content.
2. [Guidance notes for the user to be deleted prior to use.]
3. Example text to be edited by the user prior to use.

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Aim / Objectives

[A sediment sampling and analysis program aims to determine and monitor physical properties of sediment along an LGA's coastline. The information gathered is mainly used to inform planning and implementation of any potential future dredging, sand nourishment or sand bypassing/back passing works. Other uses of a sediment sampling and analysis program could include the following.

- Assessing the amenity of a beach.
- Preparing sediment origin or sediment transport plans.
- Sediment transport or plume modelling.
- Assessing the sediment for contaminants and toxins.

The LGA will need to consider what a sediment sampling and analysis program may entail, and the type(s) of analysis required. The LGA will need to scale this scope accordingly.

Present required data and outcomes from the survey(s) here.]

A sediment sampling and analysis program aims to determine and monitor physical properties of sediment along the LGA's coastline. This information will then be used to inform planning and implementation of any potential assessments or works.

Extent

[When used in dredging, sand nourishment or bypassing works, sediment sampling is often completed at two locations, where the sediment is being extracted (borrowed or source site) and where sediment is being placed (disposal or fill site).

The collection of sediment samples across the beach can be undertaken using methods applicable to the requirements of monitoring. A common method is to collect a representative sample over an entire beach profile, as the properties of beach sediments can vary across the profile. Representative beach sediment samples are commonly collected as an equal parts mix of subsamples from the shoreline, the beach berm and at the base of the dunes/rear of the beach. Other collection options can include the following.

- Offshore or submerged samples collected by divers or vessel-borne sediment grabs.
- Grid samples taken to determine sediment movements or contaminant locations.
- Samples taken along a profile to assess changes in the profile.
- Dune samples.
- Samples taken at both the surface and dug below the surface for representative sampling, such as samples taken with a sediment collection pipe.

The shape and alignment of a beach can change seasonally and over time. To ensure sampling locations remain consistent during future monitoring, the samples should be collected along the alignment of beach profiles. Profiles should be situated at useful locations, such as fronting important assets, or where sediment modelling, sand nourishment and/or bypassing is planned. Profiles preferably align with existing or planned beach survey transects (refer to the Beach Survey Transect specification on DoT's website).

If assessing a beach for potential contaminants and toxins, the samples should not be mixed, and clear sampling locations should be established.

Generally, sediments are recommended to be captured using a representative sample. As such, the scope requires representative profiles for sediment sampling. The LGA should adjust the scope accordingly to suit their requirements.]

The LGA manages approximately XX km of coast, stretching from XX to XX. Along this section of coast, the LGA is monitoring sediment properties in the following areas.

- Area one.
- Area two.
- Area three.

Within these areas, the sediment is to be sampled along predetermined beach profiles with equal parts gathered from the shoreline, the beach berm and at the base of the dunes/rear of the beach. The coordinates of these profiles are included in the following table, while the following figure visually represents their location.

Table 1 Example Profile Locations. [Example locations from City of Kwinana CMAP.]

Profiles	Start N	Start E	End N	End E
Challenger Beach North	-32.1823	115.7751	-32.1822	115.775262
Challenger Beach South	-32.1839	115.7752	-32.1839	115.775552
Wells Park North	-32.2468	115.7574	-32.2469	115.757685
Wells Park South	-32.2484	115.7568	-32.2484	115.756673

Figure 1 Example Profile Locations at Area One. [Example from City of Kwinana CMAP.]

Background

[Provide a brief background for each area as required, this can include background to a given project relating to the sampling. This section should include information such as access requirements and any other relevant information the LGA can provide.

The background of an example area is included below.]

Background Example

The City of *Kwinana Coastal Adaptation Plan* prepared by GHD (2016) outlines recommended coastal management strategies, including possible sand nourishment for the Wells Park area. This sediment sampling will assist with management and design of any potential future nourishment works.

[Include other areas if required]

Tasks

[The tasks outlined in this section detail the required components of sediment sampling and analysis.

It is noted that the collection of sediment samples could be undertaken by an LGA if they have the capacity, whereby the analysis component would be procured through a suitable Consultant.]

The following tasks are required to be completed by the Consultant as part of sediment sampling and analysis.

1. Task 1 – Collect sediment samples.
2. Task 2 – Review and analyse samples
3. Task 3 – Presentation of results.

Task 1 – Collect Sediment Samples

[The collection of sediment samples should be conducted uniformly across the LGA's coastline.

The requirements of sampling and analysis will determine the process for the collection of samples.

Should sampling be completed in a subsea or offshore environment, then sediment may need to be collected by a commercial or professional diver.

This task has been written for the planning and implementation of any potential future sand bypassing/back passing or sand nourishment works. The LGA may need to adjust this task as required.]

As properties of beach sediments can vary across the beach profile, a representation of the entire beach profile is required to be collected. This representation will entail a collection of sediment samples from the shoreline, the beach berm and at the base of the dunes/rear of the beach. These samples will be taken along the profiles supplied in this scope.

The collection of samples should follow a process similar to the process outlined in the methodology.

Task 2 – Review and Analyse Samples

[The collected samples will require analysis and review, provide the key properties that the samples need to be assessed for.]

The Consultant is to analyse each representation to determine key properties of the sediment. The analysis is required to be undertaken by a National Association Testing Authorities (NATA) accredited laboratory only. The following properties are required to be determined [LGA to adjust as required. Please note that testing for some properties such as mineralogy are, while useful, considerably more expensive than other simpler tests for properties like particle size distribution. A pre-scoping discussion with prospective Consultants may be helpful to guide expected costings.].

- Particle size distribution, grading and sorting.
- Clay content
- Colour.
- General composition.
- Roundness.
- Acidity.
- Wet and dry bulk densities.
- Mineralogy/contaminants.

Task 3 – Presentation of Results

[Depending on monitoring requirements of the LGA, the required presentation of results can be adjusted. At a minimum, the analysis report and results are expected to be presented.]

The Consultant is to provide a report containing the outcomes of sediment sampling and analysis. This report should include the location of sample collection, results of the analysis and any recommendations for ongoing management, including suitability for use if contaminants are found.

Methodology

[Provide a brief overview of a methodology for the collection of samples and a list of required assessment criteria. The LGA should be cautious when prescribing a methodology as it may lead to additional costs and complications. The following methodology should be used as a guide.]

As part of the Consultant's response to the LGA, they are to provide a methodology for the sediment sampling and analysis work. The following section outlines key components required for the works and should only be used as a guideline.

The methodology is expected to include the following steps.

Collection of Samples

1. Confirm access and extent requirements.
2. Confirm and comply with all WHS requirements.
3. The samples are to be collected during low tide.
4. The sample collector shall position and orient themselves along the beach profile (at the required location).
5. Samples shall be collected by hand from (the required locations).
   - adjacent to the shoreline;
   - at the base of the dunes or rear of the beach; and
   - at the beach berm, or approximately halfway between the two previous samples if no visible beach beam is present.

6. At each sample location, the top 10 to 15 cm will be brushed aside and not collected unless a sediment collection pipe can be used for sampling.
7. Observations during the sample collection are required to be recorded, including odour.
8. Approximately 1 Cup of beach sediment or more will be collected at each sample location using a graduated measuring cup or sediment collection pipe. Care shall be taken to ensure equal amounts of sediment are collected from each sample location. If desiring an average from a whole profile the samples can be combined, ensuring thorough mixing, into a single container and labelled.
9. The sample locations will be photographed, and their coordinates recorded.

This process will be repeated at each required location.

[The collection of samples could be completed by LGA staff if capacity allows. This would likely result in cost savings for the LGA.]

Analysis of Samples

The analysis is to be completed by a NATA accredited laboratory using appropriate methods detailed by Australian Standards.

Result Presentation

Results and outcomes of the analysis are to be presented in one summary report, this is to include all testing, analyses and results.

Deliverables

[In this section the LGA should consider the requirements of sediment sampling and analysis results and ensure they are met within the deliverables.

The LGA is to confirm the requirements of the works and adjust deliverables as required.]

The Consultant is required to provide a summary report of the sediment sampling and analysis results. This should include the following points.

1. Specific sample collection locations.
2. The method used to collect samples.
3. Site observations.
4. Summary of the analysis and testing methods and results.
5. All analysis and testing reports and results.
6. Comparison of properties to previous assessments. [if required.]
7. Recommendations on suitability for proposed bypassing. [if required.]
8. (Include any requirements specific to the LGA).

Timeframe

[Use this section to request an estimate of the project's timeline or include a deadline if required.

The timing of the works can also be specified here.]

The Consultant is to complete the sample collection during (specify time e.g. October) and supply the report within XX weeks from the award of works.)

[OR]

The Consultant is to complete the sample collection during (specify time e.g. October) and provide a program for the works detailing the estimated completion date.

Documents and Files to be Provided

[This is where the LGA can provide details of any documents and files that will assist the Consultant conducting the works. Examples of these documents are included below.]

The following files (and documents) will be provided to the Consultant on the award of the works.

- Previous sediment analysis results. [If applicable.]
- Details of any changes or works since the last analysis. [If applicable.]
- Details of any specific labelling requirements.
- Any relevant documents the LGA has access to.

Appendices

[Include any required documents, these could include previous analysis reports or files containing the required collection points.]