PROJECT PROGRESS VALUE ASSESSMENT

Review of records and substantive progress and assessment against a contemporaneous first principles cost estimate

West Nowra Bioelektra resource recovery facility – Shoalhaven City Council

August 2023

Prepared for: Shoalhaven City Council

Project ID: 23L0053 - West Nowra Bioelektra resource recovery facility

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Statement of limitations

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Executive summary

Shoalhaven City Council (SCC) has engaged MIEngineers (July 2023) to assist them with a progress value assessment of their project, West Nowra Bioelektra resource recovery facility. MIEngineers has conducted a review of records and the substantive project progress on and off-site and prepared a contemporaneous first principles-based cost estimate to inform conclusions regarding the value of progress up to July 2023.

Records review insights

SCC engaged Bioelektra Australia Pty Ltd (Bioelektra) to design, manage approvals, construct, commission, and operate the facility for a period of 20 years. Bioelektra procured several subcontract packages for project management, design and related services, and a main building contractor.

The Design has been developed to inform development applications for stages 1 and 2 and for a construction certificate for stage 1, including architectural, civil, structural, building services, and process plant and equipment.

The project has received development approval for stages 1 and 2, and a construction certificate for stage 1.

Stage 1 works (to make for a building pad) are generally complete except for minor items.

We understand that Bioelektra has since entered voluntary administration, subsequently ceasing works onsite, and it is uncertain if the company will be able to recommence works and fulfil their obligations under the contract with SCC.

Methodology

SCC has provided to us a copy of relevant records received by them from Bioelektra. These records included project design and cost information, which were reviewed for relevance, and accuracy. Relevant records were extracted to inform completed scope and associated cost, however, because we could not validate all cost information, we also undertook a first principles-based cost estimate for comparison purposes.

Value of progress conclusions

A summary of costs determined by each method follows.

Table 1, Summary cost estimate

Item description	Forecast cost (GST Exclusive)	
	Method 1 - Review of records	Method 2 - First principles based
Design and approvals	$700K	$1M
Construction	$1.5M to $2.1M	$1.8M
Total	**$2.2M to $2.8M**	**$2.8M**

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1. Introduction

1.1. Background

The West Nowra Bioelektra resource recovery facility (the Project) is the Shoalhaven City Council's (SCC) active project which has commenced the design and construction of a resource recovery facility in Mundamia to collect and process 130,000 tonnes of general waste per year.

Following development consent in 2016 (SSD7015), Bioelektra Australia Pty Ltd (Bioelektra) was engaged by Shoalhaven City Council to design, construct, and operate the facility for 20 years1. Following engagement, Bioelektra have progressed the design for the site enabling works and commenced and progressed enabling works construction. We understand that Bioelektra has since entered voluntary administration, subsequently ceasing works onsite, and it is uncertain if the company will be able to recommence works and fulfil their obligations under the contract with SCC.

SCC is taking action to mitigate project losses and assess project progress to date and consider its options to advance the project.

SCC has also been requested by the NSW Government Office of Local Government to demonstratethe value of the works completed to date, the subject of this Report.

1.2. Project overview

The site of the project is located at 114 Flatrock Road in Mundamia, NSW 2541 and comprises of 3.6 hectares (ha), located approximately 5 km west of the Nowra Central Business District, and adjacent to the existing West Nowra Recycling and Waste Facility.

The project generally comprises:

Stage 1:

- Site clearing and including demolition of existing structures and tree removal.
- Establish bushfire asset protection zone.
- Strip topsoil and earthworks.
- Boundary fencing.

Stage 2:

- Construction of a 10,000m2 building to house process plant and equipment, offices, and amenities for staff and visitors.
- Civil pavements for driveways and car parking.
- Pumping station and firefighting tanks.
- Weighbridge and weighbridge offices.
- External services and Landscaping.

1.3. MIEngineers' brief

MIEngineers was requested by Shoalhaven City Council to provide a project progress value assessment using the collected project records, site progress, quantity take-offs.

[1] The contract between SCC and Bioelektra was not shared with us. Information relating to the agreement between these parties is based on conversation with SCC personnel.

1.4. Purpose of this report

The purpose of this report is to inform SCC and its stakeholders as to the value of works carried out to date on the Project by Bioelektra for comparison to money paid to the company and planning to progress the project.

1.5. Methodology

The review will seek to determine the cost of works completed to date on the project using 2 methods, the first being by way of a review of records and the second, a first principles-based cost estimate. More details follow.

1.5.1. Review of records

SCC has provided to us on 04/07/2023 a copy of relevant records received by them from Bioelektra. These are summarised in Appendix 1.

These records included project design and cost information, which were reviewed for relevance, and accuracy. Relevant records were extracted to inform completed scope and associated cost, which was then summarised in Section 2.

None of the cost information provided could be verified, which is why we carried out the assessment using 2 methodologies, the other being a first principles-based cost estimate, which is explained in Section 1.5.2. However, we have provided commentary as to the cost magnitude in relation to relevant recent projects and industry standard rates.

1.5.2. First principles-based cost estimate

The process used to develop a first principles-based cost estimate follows.

- Quantity take-off. AutoCAD 12D model and Bluebeam Revu software was generally used to capture the information from the drawings and to provide traceable quantity take-offs. Further detail of documents used, assumptions made, and processes followed is included in Section 3.2.
- Develop job specific pay items.
- Develop rates using either of:
    - First principles rates that are resource based;
    - From recent nearby projects of a similar type and scale; or
    - Accepted rates used in industry for similar purposes.
- Compile estimate using above referred quantities and rates.
- Internal review and update.

2. Records review

MIEngineers' review of project records identified significant information to inform the progress assessment and associated quantity take-off and estimation tasks. The following sub-sections present the key information which was subsequently used to quantify and cost the project progress.

A summary of records reviewed, and insights gained in included in Appendix A.

2.1. Site visit

Representatives from MIEngineers undertook a walkover of the site on Monday 24/07/2023. The walkover viewed completed works and allowed for confirmation of scope items in the quantity determination.

2.2. Design progress

According to Bioelektra, the Design has been developed to 60-70%[2], and it would appear this was a reasonable statement based on the extent of design completed. A summary of design documents developed follows.

Table 2 Design progress summary

Document	Dated	Origin	Status
Biodiversity Assessment Report	2015	GHD	Final. Issued as part of development application, which was subsequently approved.
Air Quality Assessment	Mar-08		
Bushfire assessment	Oct-15		
Greenhouse Gas Assessment	Oct-15		
Hazard Analysis	Oct-15		
Capital Investment Value (CIV) calculation and employment estimates	Oct-15		
EIA Air quality assessment	Nov-15		
Noise Assessment	Nov-15		
Traffic and Transport Assessment Report	Nov-15		
Environmental impact statement (EIS)	Jan-16		
Summary Consultation Report	Oct-15	SCC	
Asbestos Register - 114 Flatrock Rd Mundamia	Not shown	Not shown	Pre-existing and as built
Survey files	Not shown	Not shown	Not applicable
Civil design drawings	Jun-2021	Van der Meer (NSW) Pty ltd	For Approval
Wastewater treatment plant drawings	Aug-21	Aerofloat (Australia) Pty Ltd	Proposal
Architectural design drawings	Aug-21	John R. Brogan and Associates Pty Limited	Design and construct tender issue
BCA memorandum	Aug-21	BCA Logic	Not applicable
Civil design drawings	Sep-2022	Calibre Group	Issued for construction certificate
Structural design drawings	Aug-21	Van der Meer (NSW) Pty ltd	Revision in progress
Building services design drawings - fire.	Aug-21	Integrated Group Services	Preliminary tender issue
Building services design drawings - hydraulic	Aug-21	Integrated Group Services	
Building services design drawings - mechanical	Aug-21	Integrated Group Services	
Stage 2 detailed site investigation	21/06/2022	Sydney Environmental Group	

2.3. Approvals

A summary of approvals follows.

[2] By reference to the PPR issued with the building tender package.

- Stage 1:
    - Development consent number: SSD 7015
        - Consent Authority: Minister for Planning
        - Date of Determination: 25/08/2016
        - S4.55 Modification reference number: SSD-7015-MOD-1
        - Date of Determination: 02/11/2021
    - Construction Certificate:
        - Reference number: 21/1170/01
        - Issued by Steven Watson and Partners
        - Dated 21/01/2022.
- Stage 2:
    - Development consent number: SSD 9887
        - Consent Authority: Minister for Planning
        - Date of Determination: 23/12/2021

2.4. Site progress

Stage 1 works were generally complete except for:

- Final testing certification of fill to comply with a level 1 standard in accordance with AS3798-2007.
- Outstanding demolition works including light poles and old carpark fencing logs.
- Earthworks associated with sediment ponds and basin for contaminated fire water.
- Leveling to the underside of slab bulk excavation level (RL48.6).
- Export of unused topsoil.

A review of available aerial images over time was conducted and a summary of works observed follows. Also refer Appendix C for a timeline of aerial images showing works on site over time.

Table 3, summary of works to date based on review of aerial images.

Date	Phase	Completed works	Construction activities
02/02/2023	Pre-construction	Nil	Nil
24/06/2022	Construction	▪ Site establishment – evidence of site sheds, mobilisation of equipment etc. ▪ Erosion and sediment control – evidence of sediment fence installation.	▪ Clearing and grubbing. ▪ Demolition – ancillary structures being demolished.
30/07/2022	Construction	▪ Erosion and sediment control – stabilised site access. ▪ Demolition – all structures demolished. ▪ Clearing and grubbing – all vegetation has been cleared. ▪ Topsoil stripping. ▪ Stockpiling of material. The image shows five material stockpiles. The north-western stockpile is coloured a darker black/brown than the other stockpiles. Further discussion on material stockpiles is provided below.	Earthworks cut/fill and importation of fill appear to have recently commenced.
12/09/2022	Construction		▪ Topsoil handling – Excavators appear to be handling topsoil into two stockpiles at the south-east and north-west of the site.

Date	Phase	Completed works	Construction activities
			▪ Access construction – the existing access has been removed and two accesses are under construction onto Flatrock Road.
02/02/2023	Post construction	▪ Excavation of a wet sediment basin on the eastern boundary of the site. ▪ Excavation of two borrow pits/temporary sediment basins at the north-eastern corner of the site. Note, these are holding water on the aerial imagery, however, were dry during the site walkover. ▪ Expansion of the two stockpiles from the previous image (assumed to be topsoil). ▪ Creation of three additional stockpiles towards the northern portion of the site. Refer below for discussion on stockpiles. ▪ Earthworks operations. There is evidence of a grey material placed for part of the site.	
30/05/2023	Post construction	▪ 3 x site sheds removed. ▪ Shaker grid removed.	
30/06/2023	Post construction	▪ Removal of remaining skip bins and material.	

2.5. Procurement

SCC engaged Bioelektra to design, manage approvals, construct, commission, and operate the facility. Bioelektra procured several packages for project management, design and related services, and a main building contractor. All of which have been summarised in Table 2 and Table 4. Figure 1 provides a flow chart showing the planned organisation chart for the construction phase.

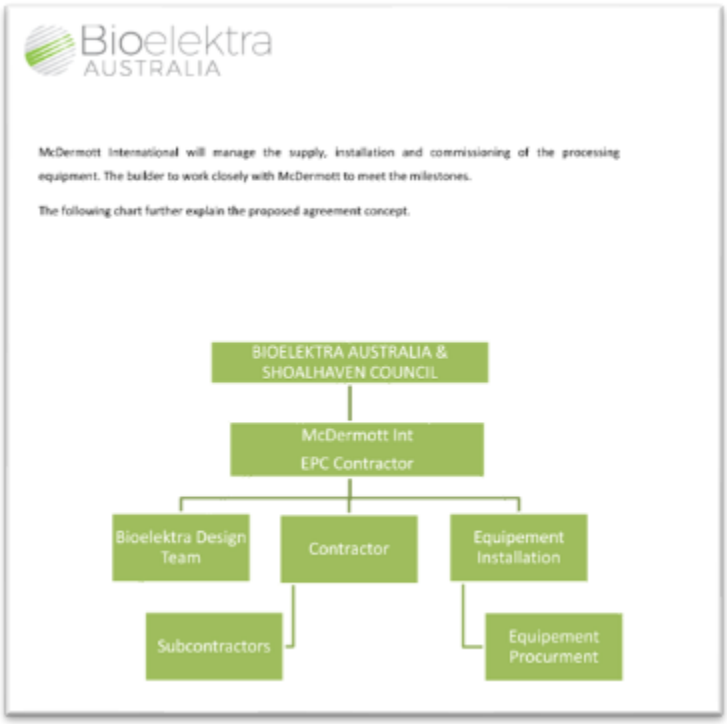

Figure 1, Extract from Bioelektra document titled Principal Project Requirements relating to organisational structure.

On 15 June 2023, Council was advised that the creditors of Bioelektra Australia Pty Limited had placed the company in liquidation. Council will now consider the options available for the delivery of the resource recovery facility.

2.6. Cost summary

A summary of costs incurred is provided in Table 4 and further detail is provided in Appendix B. All costs figures shown are exclusive of GST.

Table 4 Summary of costs incurred based on review of records.

Category	item	Cost
Architectural	Design drawings	$48,370
Civil	Design drawings	$15,000
Structural	Design drawings	$15,000
BCA	Review memorandum	$10,500
Fire engineering	Report	$1,200
Electrical	Design drawings	$25,000
Mechanical	Design drawings	$25,000
Hydraulic and Civil	Design drawings	$45,000
PCA	Construction certificate	$43,250
Approvals	Manage design, carry out investigations, prepare and submit and approval submissions	$341,000
Traffic	Investigations and reporting	$2,700
Bushfire	Investigations and reporting	$2,118
Site audit	Report	$2,859
Other consulting fees	Records show that money was paid to BECA. Report not sighted, but it is possible that other design services would be required.	$40,200
Preliminaries	Bioelektra (Client-side) project management team	$261,790
Preliminaries	Builder/civil contractor (contractor-side) project management team, site establishment, environmental controls, and amenities.	$222,155
Site clearing	Clear and grub trees, demolish structures, removal of contamination.	$216,417
Earthworks	Strip topsoil, cut to fill, import, and fill, and testing and certification of the same.	$711,448
Stage 2 construction works	It is not clear from the records what stage 2 scope was undertaken.	$166,650
		$2,195,657, rounded to $2.2M

Cost of work outstanding for stage 1 based on a first principles cost estimate follows.

Table 5, Stage 1 outstanding works

Category	item	Quantity	Unit	Rate	Cost
Earthworks	Level 1 compaction certificates for all completed filling onsite	1	LS	$10,000	$10,000
Earthworks	Levelling of pad to the underside of the building pad	1,870*	m^3	$38.50	$71,995
Demolition	Demolition and disposal of miscellaneous remaining structures	1	LS	$10,000	$10,000
					$91,995, rounded to $100K

* Figure is based on a calculation of the as constructed earthworks surface compared with the nominated bulk excavation level.

Other works that could be considered stage 1 but have not been included above are summarised as follows.

Table 6, Summary of costs recorded but not included in estimate.

Element	Reason for not including item in cost of works completed
Transport and disposal of excess topsoil from site	There is apparently ~3,500 tonne of topsoil on site that requires disposal, which could cost upwards of $500K, which if considered in the builder's stage 1 earthworks fee would constitute 70% of their earthworks fee, which isn't realistic and based on our understanding of the cost of the works from the first principles cost estimate, it would appear this element was not considered in the contractor's pricing of the scope, but rather are likely to be costs that were not anticipated.
Temporary carpark	This element relates to temporary works associated with stage 2 as there was a car park and amenities in place for stage 1. Our understanding of stage 1 works is from the Principals Project Requirements (PPR) document prepared by Bioelektra, but the builder could have let subcontracts differently.

Costs incurred that may not be recoverable.

Table 7, Summary of likely unrecoverable costs

Category	Item	Cost
Procurement	Builder (Taylor constructions) were engaged and started work on the project but pulled out. Records show a sum of money was paid to Taylor Constructions, but it is not clear what work was carried out for this payment and if it is of any benefit to SCC or the project. It is possible that the money went towards design and associated coordination, which has value for the project ongoing.	$430K
Process plant and equipment	It is likely that Bioelektra entered into an agreement with the Bioelektra Group (process plant and equipment supplier, which is a different entity to Bioelektra Australia) and made down-payments to enable design and procurement, and by their records, payments were made. However, we have seen minimal evidence of design developed and no evidence of material procured.	$4.5M
		$4.93M

There are possibly other expenses that were not recorded in the documents that formed the basis of our review, and some costs appear low when compared with relevant recent comparable projects. A summary follows.

- There is no cost item for the Calibre Group civil design drawings in the summary of costs included in the Milestone 2 payment claim. It appears that Van der Meer consulting prepared civil drawings to inform the development application, and Calibre Group prepared drawings to inform the construction certificate application. Van der Meer consulting drawings were included in the building package tender and the Calibre Group drawings were not included. The Calibre Group drawings are dated after the building package was awarded, which contradicts the plan that the builder would develop the design to completion upon award.
- Payment for Bioelektra staff and associated costs is not shown, but they were managing the project throughout, with the help of consultant project managers.
- Fees for designers shown are rounded figures that appear more like budget costing that actual because the figure for different disciplines are similar and figures are generally rounded to the nearest $5k. Moreover, based on our experience with recent project of a similar type and scale, the fees seem low.

In summary, based on a review of records, we estimate that the value of works undertaken to date on the project could be within the range outlined below. All figures are rounded for ease of reference.

Table 8, Cost range based on review of records.

Range type	Forecast costs	Basis
Lower limit	$2.1M	Most likely amount less the cost of works outstanding for stage 1 based Table 5.
Most likely	$2.2M	Our assessment detailed in Table 4.
Upper limit	$2.63M	All recorded costs except for the amount shown paid to the Bioelektra Group on the basis that this is non recoverable.

3. Quantity take-off and cost estimation

3.1. Information used for the assessment

3.1.1. Pre-Development Survey

SCC supplied a survey file for site (file reference '82-2017 SURVEY'). Whilst the file did not include details on information such as surveyor, survey date, coordinate system etc, it is assumed this file is the survey of the site prior to works commencing (likely survey date is 2017 given the file name, although not verified).

Limitations or qualifications on the survey are as follows:

- No checks or verification of levels were undertaken.
- The survey file did not include a digital terrain model (DTM). Hence, the DTM was created using available points. The DTM did not match the existing contours exactly, with some minor differences in surface levels of nominal 300mm in localised areas, typically around the existing structures.
- The survey consists of existing dams/water bodies. The existing surface DTM was created using the surveyed water level of the dams as no data was available on the bed level of the dams. Estimated volumes therefore may underestimate the material required to fill the existing dams.
- The survey blocked out the existing structures. The existing surface DTM assumed a continuation of adjoining levels for purposes of earthworks quantities estimation following demolition of the structures.

3.1.2. As-Built Survey

An as-built survey was supplied by SCC representing works completed as of March 2023. Survey works were completed by Axiom Spatial (engagement by RP Infrastructure) with a drawing issue date of 14/03/2023. The survey's origin of levels was adopted from a known point within 82-2017 SURVEY (pre-development survey); hence, the as-built survey is located on the same coordinate system as the pre-development survey.

Limitations or qualifications on the survey follow:

- No checks or verification of levels were undertaken.
- The survey consists of existing sediment basins and borrow pits on the north/eastern boundary of the site. The as-built DTM was created using the surveyed water level of two basins as no data was available on the bed level.

3.1.3. Construction Certificate Civil Design Drawings

Council supplied Construction Certificate (CC) design drawings for the proposed development (Calibre Group Reference 22-000189 Revision F, dated 14/09/2022). No model specific files were provided to allow for integration and interrogation in the earthworks model, and the data used to develop the drawings is not known.

3.2. Quantities

3.2.1. Topsoil Strip

The CC civil design drawings nominated a topsoil strip of 200mm over the footprint of the site. However, no evidence is available to verify the actual depth of topsoil stripped on site. Hence, MIEngineers undertook the following to estimate stripping quantities:

- Review of aerial imagery.
- Site inspection.
- 12d model calculations.

As noted in Table 3, aerial imagery shows evidence of topsoil stripping and handling between 30/07/2022 and 02/02/2023. Aerial imagery and the as-built survey show five stockpiles following the completion of works on site. Based on Table 3 and the site walkover, it is assumed that the south-eastern and north-western stockpiles consist of topsoil.

The volume of material in the assumed topsoil stockpiles was estimated using the as-built survey and equate to approximately 4,965m³. This volume corresponds to a stripping depth of nominal 140mm over the footprint of the site. This depth has been adopted for the earthworks assessment below.

3.2.2. Cut to Stockpile

The remaining three stockpiles do not appear to contain topsoil (unless covered and not visible). It is assumed that these stockpiles are cut to stockpile, with the material not deemed usable in the earthwork's operations. The volume of material in these stockpiles was estimated using the as-built survey, corresponding to a volume of 2,115m³.

3.2.3. Cut to Fill

The as-built survey was modified in 12d model to remove the above stockpiles from the DTM to assess earthworks volumes. The earthworks volumes from stripped surface (140mm topsoil strip) to as—built survey are summarised in Table 9 below.

Table 9, Earthworks Summary - Unadjusted

Earthworks operation	Value
Cut	3,695m³
Fill	10,150m³
Balance	6,455m³

The following adjustments/qualifications apply to the volumes in Table 9:

- No adjustment has been made to account for discrepancies below the surveyed water level on existing dams as this has been covered elsewhere under a different pay item.
- Adjustment for bed level below the surveyed water level on the two basins/borrow pits in the as-built survey:

  - Northern basin – assumed average depth 150mm over the extent of the basin (310m² area in the as-built survey, corresponding to 46.5m² additional cut material generated). Assumption is based on the site walkover.
  - Eastern basin – assumed average depth 750mm based on the Calibre Group CC Design Drawings (Section D on sheet C211, 630m² basin area in the as-built survey, corresponding to 475m³ additional cut material generated).
- Adjustment for the importation and placement of basecourse for the two accesses to Flatrock Road (estimated volume of 110 m³ reduction in fill material required).

Table 10, Earthworks Summary - Adjusted

Earthworks operation	Value
Cut	4,215m³
Fill	10,040m³
Balance	5,825m³

3.2.4. Importation and Placement of Fill

In accordance with Table 10 above, the allowance for the importation and placement of fill is 5,825m³.

All filling on site was to comply with AS3798-2007 to Level 1 supervision. As per Table 8.1 of AS3798, it is assumed the earthworks operations fall under Type 1 large scale operations. Table 8.1 requires a minimum frequency of tests as follows:

The greatest of:

a) 1 test per 500m³ distributed reasonable evenly throughout full depth and area.

b) 1 test per layer per material type per 2,500m².

c) 1 test per 200mm thickness per material type per 2,500m².

d) 1 test per lot.

Table 11 summaries the calculations to estimate the number of tests required:

Table 11, Estimated geotechnical testing requirements.

Scenario	No. of Tests
a	21
b	Refer case c
c	28
d	1

Hence, an allowance for 30 tests has been made.

3.2.5. Re-spreading Topsoil

No evidence of topsoil spreading was observed on site during the site walkover. Hence, no allowances have been made in the quantities.

3.3. Rates

3.3.1. General

Rates were either developed using first principles that are resource based, adopted from recent nearby projects of a similar type and scale, or adopting accepted rates from industry. A description of rate build-up is included in Table 14.

3.3.2. Timing

All rates are based on September 2021 values to align with the tender period for the project, to align with the project timing.

3.3.3. Margin and overheads

Rates include 15% for margin and 5% for risk contingency.

3.3.4. Additional information on specific rates

The following documents were referenced:

- NSW Government Transport Guidelines for global strategic rates for project cost estimating, with document number ILC-MI-TP0-601-G02, Version 1.1, dated 07-Aug-19 (ILC-MI-TP0-601-G02)
- Rawlinsons Handbook Edition 39, 2021 (Rawlinsons)

All rates are based on a project value of $30M, which is the value (rounded) of the civil and building works as presented in [Builder] Tender price breakdown comparison received as part of the project records.

A summary of rates adopted follows.

Table 12, Rates from reference material

Cost component	Rate - ILC-MI-TP0-601-G02	Rate - Rawlinsons	Rate adopted
Design, investigation, and approvals	4% - 6% of project costs	None provided	4%
Project management	7.5% - 13% for urban projects up to $50M of construction costs	8% - 10% for industrial and factories.	10%
Client representation	10% of project management costs	None provided	10%

In addition to reviewing industry accepted rates, we investigated the cost of the design and approvals phase for some relevant recent and nearby projects for reference to corroborate the above rates. Both projects are being managed by SCC and information received from them is contained in Appendix D. A summary follows.

Table 13, Reference projects design and investigations costs

Project	Value	Description	Cost of design and approvals (~, exc. GST)
West Nowra material recovery facility	$35M	The facility will source commingled recyclables from across the Illawarra and Shoalhaven with a processing rate of 15 tonnes per hour and expected annual capacity of up to 24,000 tonnes.	$750k

Project	Value	Description	Cost of design and approvals (~, exc. GST)
West Nowra landfill extension	Not known	An extension to the existing West Nowra landfill.	$1M

For the design, investigation, and approvals component, we initially considered the lower end of the bracket (4%), which resulted in a cost estimate of $1.2M. When compared to relevant recent projects it was comparatively high, so we chose to reduce this cost component to $1M as a result.

3.4. Cost summary

Table 14 provides a summary of the first principles-based cost estimate.

Table 14, First principles-based cost estimate

#	Category	Description	Qty.	Unit	Rates	Cost estimate	Comments
1	Design and approvals	Investigation and Design	1	LS	$1,000,000	$1,000,000	Refer Section 3.3.4
2	General and preliminary	Project Management / Construction Management	1	LS	$53,507	$53,507	Refer Section 3.3.4
3	General and preliminary	Client representation	1	LS	$5,351	$5,351	Refer Section 3.3.4
4	General and preliminary	Mobilise on Site	1	LS	$74,750	$74,750	Includes weather station, site office, lunchroom etc.
5	General and preliminary	Temporary Site Access (x2)	1	LS	$11,500	$11,500	
6	General and preliminary	Sediment Fence & Coir Logs	1	LS	$17,250	$17,250	
7	General and preliminary	Temporary Drainage Basin	475	m^3	$58	$27,313	630m2 - Depth assumed 0.75m based on design bulk excavation level on Calibre CC drawings.
8	General and preliminary	Dilapidation Report	1	LS	$8,625	$8,625	
9	General and preliminary	Traffic Control / Management	1	LS	$4,950	$4,950	Allowance for site establishment
10	General and preliminary	Temporary Construction Fence	745	m	$33	$24,585	
11	Earthworks	Survey Set Out	1	LS	$13,800	$13,800	Allowance for 80hrs @ $150/hr for surveyor
12	Earthworks	Utility Location - Level B	1	Day	$2,875	$2,875	Based on previous quotes from local contractors (allowance for 1 day)
13	Earthworks	Clearing & Grubbing	3	Ha.	$45,965	$147,088	40% dense clearing, 30% medium and 30% light clearing. Including 100ton of green waste to be disposed off-site.
14	Earthworks	Dewatering & Filling of Existing Dams including removal of	418	m^3	$144	$60,088	Depth of existing dams unknown, assumed 1m.

#	Category	Description	Qty.	Unit	Rates	Cost estimate	Comments
		aquatic fauna and removal of sludge.					
15	Earthworks	Demolition	1	LS	$346,500	$346,500	Main Building + Animal Shelter = 1065m2, Concrete pavement = 230m2, Driveway + Car Park = 1320m2, Fencing 1075m. $100 x 2615m2 of Buildings + Driveway = $261,500 + Fencing $50 x 1075m = $53,750.
16	Earthworks	New Boundary Fence	50	m	$385	$19,250	8ft high chain mesh fence.
17	Earthworks	Strip Topsoil and Stockpile	4965	m^3	$33	$163,845	
18	Earthworks	General Earthworks (Cut to Fill)	4215	m^3	$39	$162,278	
19	Earthworks	General Earthworks (Cut to Stockpile)	2115	m^3	$33	$69,795	
20	Earthworks	General Earthworks (Import and Place Fill)	7940	m^3	$74	$587,560	
21	Earthworks	Level 1 Testing and Supervision	30	Ea.	$523	$15,675	$500 per Test. Table 8.1 of AS3798-2007 for Type 1 large scale operations, with at least 1 per 500m3 and at least 1 test per layer per 2500m2.
22	Other	Stage 1 WAE Survey	1	LS	$7,500	$7,500	
						$2,824,083 (Rounded to $2.8M)	

4. Summary of findings

A summary of costs determined by each method follows.

Table 15, Summary of cost estimate

Item description	Forecast cost* (GST Exclusive)	
	Method 1 - Review of records	Method 2 - First principles based
Design and approvals	$620K	$1M
Construction	$1.5M to $2.1M	$1.8M
Total	**$2.12M to $2.72M**	**$2.8M**

* All figures are rounded.

5. Next steps

Depending on the level of verification of costs that is required for the stakeholders, further work could be undertaken to validate costs incurred on the project, which could include:

- Costs detailed in Section 2.6 could be verified by contacting the various organisations involved and requesting they provide tax invoices or written confirmation of works undertaken and associated costs.
- Liaising with Bioelektra Group (process plant and equipment supplier) to verify if payments were made, and if so, what design and procurement work was undertaken as a result.

As far as progressing the project, we understand SCC is considering options to progress the project.

Appendix A – Summary review of documents supplied

Note, all documents are available on request, but have been left out of appendices due to file size and number of pages for ease of file handling and reading.

Table 16 Reviewed documents index.

Category	Document	Origin	Dated	Review insights
Design and approvals	Biodiversity Assessment Report	GHD	2015	Completed as part of the EIS assessment.
Design and approvals	Pre-existing site survey	Shoalhaven City Council	2017	The survey file was used to calculate topsoil and earthworks volumes.
Design and approvals	Air Quality Assessment	GHD	Mar-08	Completed as part of the EIS assessment.
Design and approvals	EIS Bushfire assessment	GHD	Oct-15	Completed as part of the EIS assessment.
Design and approvals	Greenhouse Gas Assessment	GHD	Oct-15	Completed as part of the EIS assessment.
Design and approvals	Summary Consultation Report	Shoalhaven City Council	Oct-15	Completed as part of the EIS assessment.
Design and approvals	Hazard Analysis	GHD	Oct-15	Completed as part of the EIS assessment.
Design and approvals	CIV calculation and employment estimates	GHD	22/10/2015	Completed as part of the EIS assessment.
Design and approvals	EIA Air quality assessment	GHD	Nov-15	Completed as part of the EIS assessment.
Design and approvals	Noise Assessment	GHD	Nov-15	Completed as part of the EIS assessment.
Design and approvals	Traffic and Transport Assessment Report	GHD	Nov-15	Completed as part of the EIS assessment.
Design and approvals	Environmental impact statement	GHD	14/01/2016	The cost of completing investigations and preparing the various reports has been included in the cost estimate.
Design and approvals	Stamped DA drawings	GHD and Van der Meer Consulting	Multiple between September 2015 and June 2021	Stage 1 development application stamped plans

Category	Document	Origin	Dated	Review insights
Design and approvals	Asbestos Register - 114 Flatrock Rd Mundamia	Not shown	Not shown	Several building elements were identified to contain asbestos.
Design and approvals	Proposal for building surveying certification work	McKenzie Group	20/07/2021	Fee and service proposal to undertake a Registered Certifier's Role and Principal Certifier's Role. Assessment and approvals cost of $19K and Construction inspections for $18K.
Design and approvals	Wastewater treatment plant drawings		3/08/2021	The design drawings helped inform and verify works undertaken were in accordance with the project design requirements, however, none of the elements detailed in the drawings were constructed. The drawing status is shown as 'Proposal', and the records suggest this was the 2nd revision. The cost of preparing the design has been included in the cost estimate.
Design and approvals	Structural design drawings	Van der Meer (NSW) Pty ltd	6/08/2021	The design drawings helped inform and verify works undertaken were in accordance with the project design requirements, however, none of the elements detailed in the drawings were constructed. The drawing status is shown as 'Revision in progress'. The cost of preparing the design has been included in the cost estimate.
Design and approvals	BCA memorandum	BCA Logic	19/08/2021	Memorandum summarising the findings of a preliminary review of the design plans.
Design and approvals	Architectural design drawings	John R. Brogan and Associates Pty Limited	20/08/2021	The design drawings helped inform and verify works undertaken were in accordance with the project design requirements, however, none of the elements detailed in the drawings were constructed. The drawing status is shown as 'Design and construct tender issue', and the records suggest this was the 5th revision. The cost of preparing the design has been included in the cost estimate.
Design and approvals	Building services design drawings including fire, hydraulic, and mechanical.	Integrated Group Services	20/08/2021	The design drawings helped inform and verify works undertaken were in accordance with the project design requirements, however, none of the elements detailed in the drawings were constructed. The drawing status is shown as 'Preliminary tender issue', and the records suggest this was the 2nd revision. The cost of preparing the design has been included in the cost estimate.
Design and approvals	Builders tender Principal Project Requirements (PPR)	Bioelektra Australia	Not shown	Essentially the Principal's The Principal's requirements are project-specific components of the project. The document outlines the project organisation structure. The PPR also provides a summary of stage 1 and 2 scope, which has been adopted for the Report.
Procurement	Request for tender - Building contract	Bioelektra Australia	Not shown	The document and its contents are consistent with the stage of project and help validate works undertaken.

Category	Document	Origin	Dated	Review insights
Procurement	Building tender addendum 3	Bioelektra Australia	21/09/2021	Tender period extended to 29/09/2021. The document and its contents are consistent with the stage of project and help validate works undertaken.
Procurement	[Builder] Tender price breakdown comparison	Bioelektra Australia	Not shown	The document presents a summary of 5 tender prices including breakdown by discipline. These figures have been used to inform the cost of the works undertaken onsite.
Design and approvals	State Significant Development Assessment Report and Development Consent SSD-9887	NSW Government	Dec-21	Report explaining the decision of the SSD application, which was approved, and a number of conditions were identified for compliance by the developer (Bioelektra Australia).
Design and approvals	Construction certificate for stage 1	Steve Watson and Partners	18/01/2022	Stage 1 early works approval consisting of demolition of existing buildings, clearing of land, site grading, establish site amenities, a new site entrance, site access roads, detention basins, car parking and preparation of asset protection zones for bushfire protection.
Design and approvals	Stage 2 detailed site investigation	Sydney Environmental Group	21/06/2022	The findings of the report did not identify concentrations of contamination that needed to be dealt with apart from undertaking waste classification assessments for material proposed for export, which is required always regardless. The cost of undertaking the investigations and preparing the report have been included in the cost estimate.
Contract administration	Bioelektra invoice for Milestone 2 payment	Bioelektra Australia	21/10/2022	Included as supporting documentation was a summary of costs to date, program, and marked up drawing showing works undertaken.
Contract administration	Civil design drawings	Calibre Group	16/11/2022	The drawings generally aligned with works carried out on site and informed quantity take-off
Contract administration	Bioelektra correspondence to Shoalhaven City Council 30_01_2023	Bioelektra Australia	30/01/2023	This correspondence relates to Bioelektra communicating with SCC to keep them up to speed with plans to overcome the issue of the builder, EQ, leaving the project.
Contract administration	Bioelektra Nowra - Revised program	RP Infrastructure	1/02/2023	Following the exit of the builder, EQ Constructions, Bioelektra attempted to get the project going again and as part of that they developed a plan, communicated with council, and started planning to complete stage 1 works directly with subcontractors, and then re-tender stage 2 works. These documents described the process undertaken.
Contract administration	Bioelektra Correspondence 6_02_2023	Bioelektra Australia	6/02/2023	This correspondence relates to BA communicating with SCC to keep them up to speed with plans to overcome the issue of the builder, EQ, leaving the project.

Category	Document	Origin	Dated	Review insights
Contract administration	Bioelektra_Scope of Works - Stage 1 Completion [B]	RP Infrastructure	28/02/2023	Following the departure of the builder, EQ Constructions, by these records, Bioelektra Australia proceeded to plan to execute the works with this builder, which included meetings with the civil contractor of the builder, in an attempt to engage them directly. This document summarises the plans of BA to engage this civil contractor to finish stage 1 works and to re-tender for stage 2.
Contract administration	As-built survey	Axiom Spatial Pty Ltd	14/07/2023	The survey file was used to calculate topsoil and earthworks volumes.

Appendix B – Detailed summary of costs incurred based on review of records

Table 17, Detailed summary of costs incurred based on review of records

#	Phase	Category	item	Cost	Source of information	Notes
1	Design and approvals	Architectural	Design drawings	$48,370	Bioelektra invoice for Milestone 2 payment	
2	Design and approvals	Civil	Design drawings	$15,000	Bioelektra invoice for Milestone 2 payment	
3	Design and approvals	Structural	Design drawings	$15,000	Bioelektra invoice for Milestone 2 payment	
4	Design and approvals	BCA	Review memorandum	$10,500	Bioelektra invoice for Milestone 2 payment	
5	Design and approvals	Fire engineer	Design drawings	$1,200	Bioelektra invoice for Milestone 2 payment	
6	Design and approvals	Electrical	Design drawings	$25,000	Bioelektra invoice for Milestone 2 payment	
7	Design and approvals	Mechanical	Design drawings	$25,000	Bioelektra invoice for Milestone 2 payment	
8	Design and approvals	Hydraulic and Civil	Design drawings	$45,000	Bioelektra invoice for Milestone 2 payment	
9	Design and approvals	PCA	Construction certificate	$43,250	Bioelektra invoice for Milestone 2 payment	
10	Design and approvals	Approvals	Manage design, carry out investigations, prepare and submit and approval submissions	$341,000	Bioelektra invoice for Milestone 2 payment	
11	Design and approvals	Bushfire compliance assessment - APZ	Report	$2,118	Bioelektra invoice for Milestone 2 payment	Report not sighted, but it would have been required for the design and approvals in our view.
12	Design and approvals	Site audit	Report	$2,859	Bioelektra invoice for Milestone 2 payment	Report not sighted, but it would have been required for the design and approvals in our view.

#	Phase	Category	item	Cost	Source of information	Notes
13	Design and approvals	Other consulting fees		$40,200	Bioelektra invoice for Milestone 2 payment	Costs identified for work done by BECA
14	Design and approvals	Traffic	Investigations and reporting	$2,700	Bioelektra invoice for Milestone 2 payment	
15	Procurement	Preliminaries	Client-side project management team	$261,790	Bioelektra invoice for Milestone 2 payment	Including procurement and contract administration. Based on 25% off total forecast fee
16	Procurement	Taylors		$430,465	Bioelektra invoice for Milestone 2 payment	Taylor constructions were engaged as the builder and started work on the project but pulled out. Records show a sum of money was paid to Taylor Constructions, but it is not clear what work was carried out for this payment and if it is of any benefit to SCC or the project. It is possible that the money went towards design and associated coordination, which has value for the project ongoing.
17	Stage 1	Preliminaries	Contractor side project management team	$222,155	Bioelektra invoice for Milestone 2 payment and [Builder] Tender price breakdown comparison	Figure calculated by subtracting the site clearing and earthworks values shown on the builder tender price comparison from the amount paid to the builder to date as detailed in the Bioelektra invoice for Milestone 2 payment.
18	Stage 1	Site clearing		$216,417	[Builder] Tender price breakdown comparison	Clear and grub, demolition, and remediation.
19	Stage 1	Earthworks		$711,448	[Builder] Tender price breakdown comparison	
20	Stage 2	EQ stage 2		$166,650	Bioelektra invoice for Milestone 2 payment	It is not clear from the records what works completed were a part of stage 2.
21	Design development	Process plant and equipment		$4,500,000	Bioelektra invoice for Milestone 2 payment	By reference to the payment claim, BA claims they have paid $4.5M to Bioelektra … but we could not validate this, and we have no additional information as to what this was for.

Appendix C – Aerial photos

Figure 2, Aerial image of site - 14/02/2022

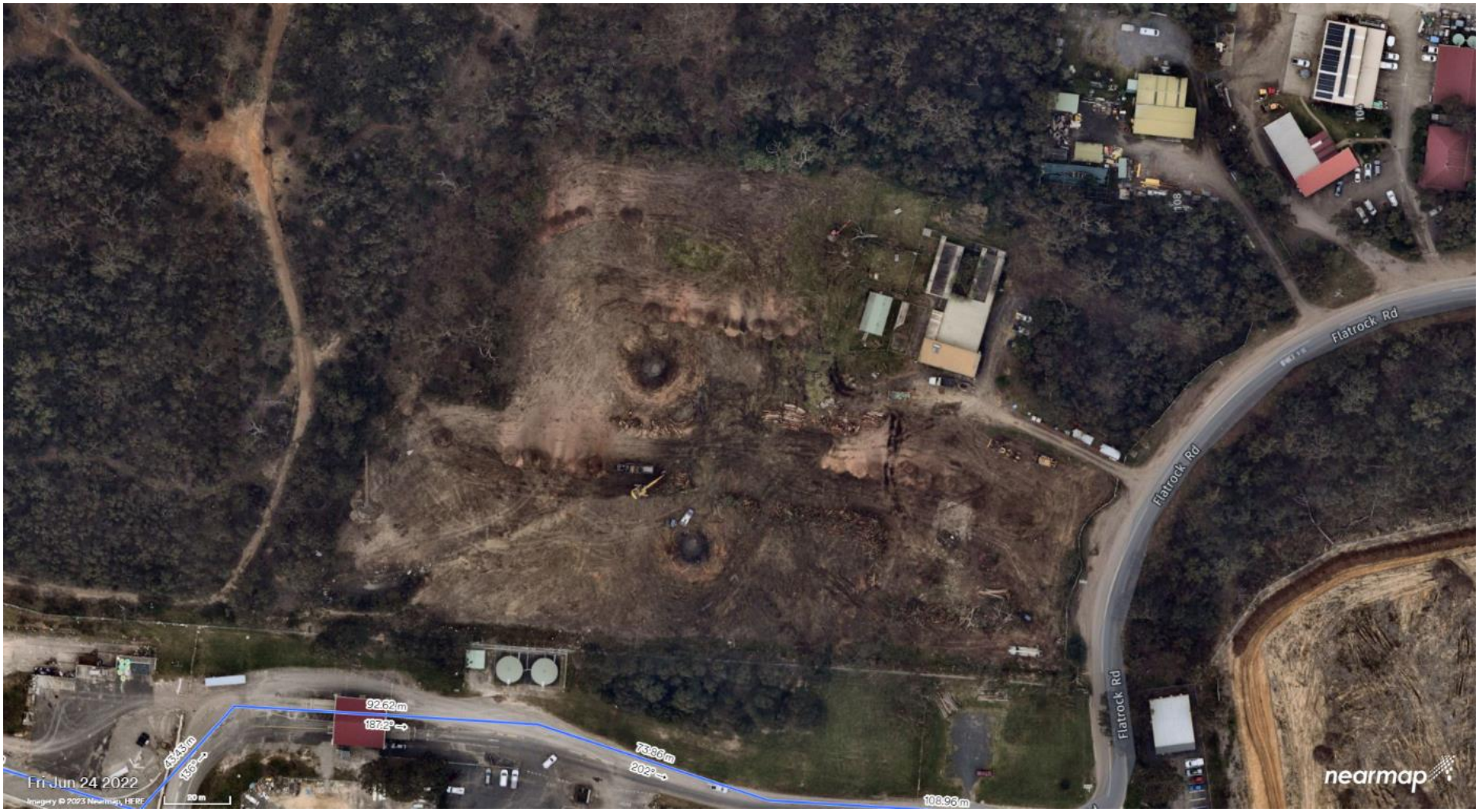

Figure 3, Aerial image of site - 24/06/2022

Figure 4, Aerial image of site - 30/07/2022

Figure 5, Aerial image of site - 12/09/2022

Figure 6, Aerial image of site - 02/02/2023

Figure 7, Aerial image of site - 30/05/2023

[redacted]

[redacted]

[redacted]