

OPERATING COST

p86-p95



Highlights

Years 1-5 cash operating cost of production is US\$25.11/lb (exclusive of royalties and sustaining capital).

Life-of-Mine All-In Sustaining Cost (AISC) of US\$34.00/lb.

Total Life-of-Mine sustaining capital estimated at A\$159M or equivalent to US\$2.36/lb.

The DFS Life-of-Mine cash operating cost has reduced by US\$3.40/lb when compared to the PFS.

ESTIMATE BASIS

The operating cost estimate for the MRP was developed by GRES with assistance from Mining Plus and is based on the LOM ore schedule, process design criteria, steady-state mass and energy balance, and metallurgical piloting undertaken as part of the DFS.

The estimate includes all costs associated with the production of 3.5Mlbs U₃O₈ per annum, including:

- » Mining;
- » Labour;
- » Fuel;
- » Power;
- » Reagents and consumables;
- » Maintenance;
- » Laboratory;
- » General and administration (including product transportation);
- » Sustaining capital; and
- » Royalties.

The operating cost estimate has been developed in accordance with the GRES standard for a DFS, and is based on costs prevailing in the Australian minerals industry for the fourth quarter 2017 (4Q17). The estimate is considered to be a Class 3 estimate according to the American Association of Cost Engineering (ACE) International with an estimate accuracy of ±10 to 15%.

The ramp-up of the MRP process plant to reach nameplate production has been estimated using 'McNaulty ramp-up curves' taking into account the level of piloting undertaken, severity of process conditions and complexity of the process. GRES has assessed the process plant will take 24 months to fully ramp-up, with the plant operating at 83% of design throughput within the first twelve months. The ramp-up profile has been built into the mine schedule and is reflected in the operating costs presented in Table 12.1 and Figure 12.1.

ESTIMATE STRUCTURE

Operating costs for the MRP have been compiled into the following cost categories:

- » Mining – all-in operating cost inclusive of diesel, labour, maintenance, contractors, tyres, consumables, pit dewatering and insurances;
- » Ore beneficiation – all-in operating cost inclusive of labour, reagents, power, maintenance, general expenses and contractors; and
- » Process plant – costs include labour, power, reagents, maintenance, freight, general expenses and administration costs which include accommodation and flights for all personnel, product transport and Perth office costs.

COST ESTIMATE SUMMARY

Operating costs have been estimated on a monthly basis for the first two years, then quarterly for a further two years and then annually thereafter. The operating cost varies according to the mine schedule and ROM material being processed through the period. Table 12.1 shows the average All-In Sustaining Cost (AISC) and cash operating cost for the MRP over the first five years and over LOM, with costs expressed in both Australian and US dollars. Uranium is predominantly sold in US dollars and this cost presentation allows direct comparison to uranium contract prices.

**OWNER-OPERATOR
TRUCK AND SHOVEL
IS THE MOST
COST-EFFECTIVE
APPROACH FOR
THE MULGA ROCK
PROJECT, ENSURING
VIMY HAS FULL
CONTROL OF
EXPENDITURE.**

Table 12.1: MRP Operating Cost Estimate

Cost Category	Operating Cost (Years 1-5)			LOM Operating Cost		
	A\$ '000/y	A\$/lb	US\$/lb	A\$ '000/y	A\$/lb	US\$/lb
Mining	46,473	13.92	9.74	52,608	16.76	11.73
Ore beneficiation	4,743	1.42	0.99	5,360	1.71	1.19
Process plant						
Labour	19,281	5.77	4.04	18,318	5.83	4.08
Power	9,934	2.98	2.08	9,900	3.15	2.21
Reagents	20,208	6.05	4.24	19,465	6.20	4.34
Maintenance	8,008	2.40	1.68	8,102	2.58	1.81
General & Admin	11,144	3.34	2.34	11,591	3.69	2.58
Total cash cost	119,791	35.88	25.11	125,344	39.92	27.95
Sustaining capital	6,492	1.94	1.36	11,165	3.38	2.36
Royalties	17,601	5.27	3.69	17,422	5.27	3.69
AISC	143,884	43.09	30.16	153,931	48.57	34.00

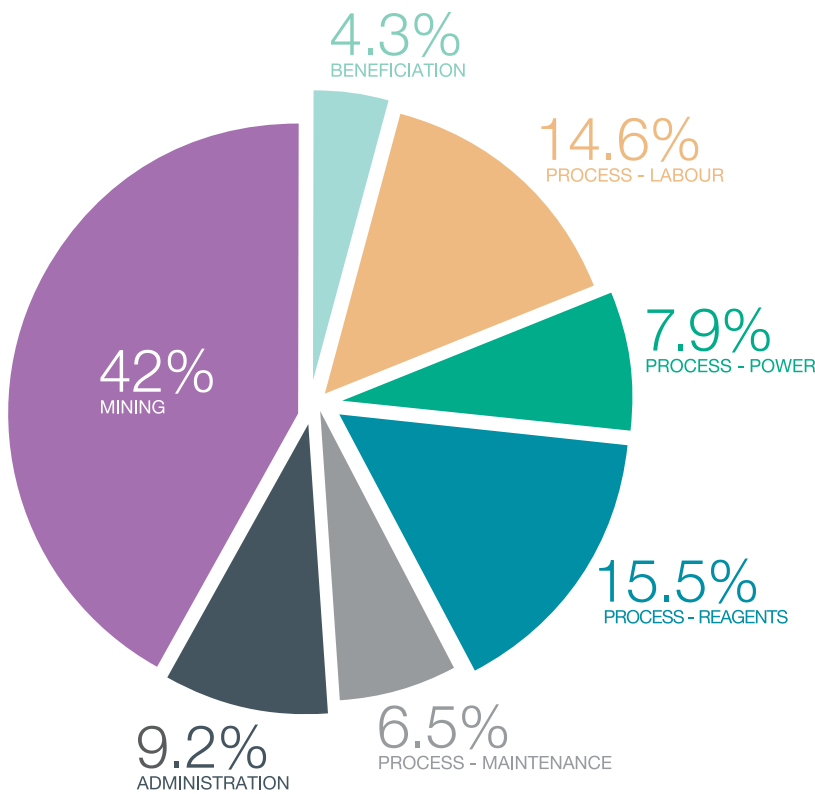


Figure 12.1: Distribution of LOM Cash Operating Costs by Area

MINING

The operating cost estimate to deliver the DFS mine schedule has been developed by Mining Plus to an accuracy of +/-10%, based on an owner-operator mining philosophy. The mining operating cost estimate includes the operation of the following items:

- » Mobile mining fleet;
- » Mobile ancillary fleet;
- » Mobile equipment maintenance;
- » Ground engagement tooling (GET);
- » Tyres and other consumables;
- » Pit dewatering system;
- » Drill and blasting;
- » ROM ore haulage;

- » Mine surveying;
- » Grade control; and
- » Technical support and administration.

Table 12.2 and Figure 12.2 show the breakdown of the mining costs over the LOM. Unit mining costs are quoted in wet metric tonnes unless stated otherwise.

It should be noted that the low unit mining cost is a result of the large ultra-class mining fleet selected, free-dig nature of the overburden and short haul distance across the pit floor due to the strip mining method adopted.

Table 12.2: Mining LOM Operating Cost – by Activity

Expenditure Area	Cost (A\$ M pa)	Unit Cost (\$/t-wet)	Unit Cost (A\$/lb U ₃ O ₈)	Unit Cost (US\$/lb U ₃ O ₈)
Labour	18.46	0.39	5.88	4.12
Diesel	12.56	0.25	4.00	2.80
Power	0.13	0.00	0.04	0.03
Ground Engagement Tools	0.30	0.01	0.10	0.07
Tyres	3.57	0.08	1.14	0.80
Maintenance	12.65	0.27	4.03	2.82
Contractors	2.66	0.06	0.85	0.59
General & Administration	2.27	0.05	0.72	0.50
Operating Cash Costs	52.61	1.11	16.76	11.73

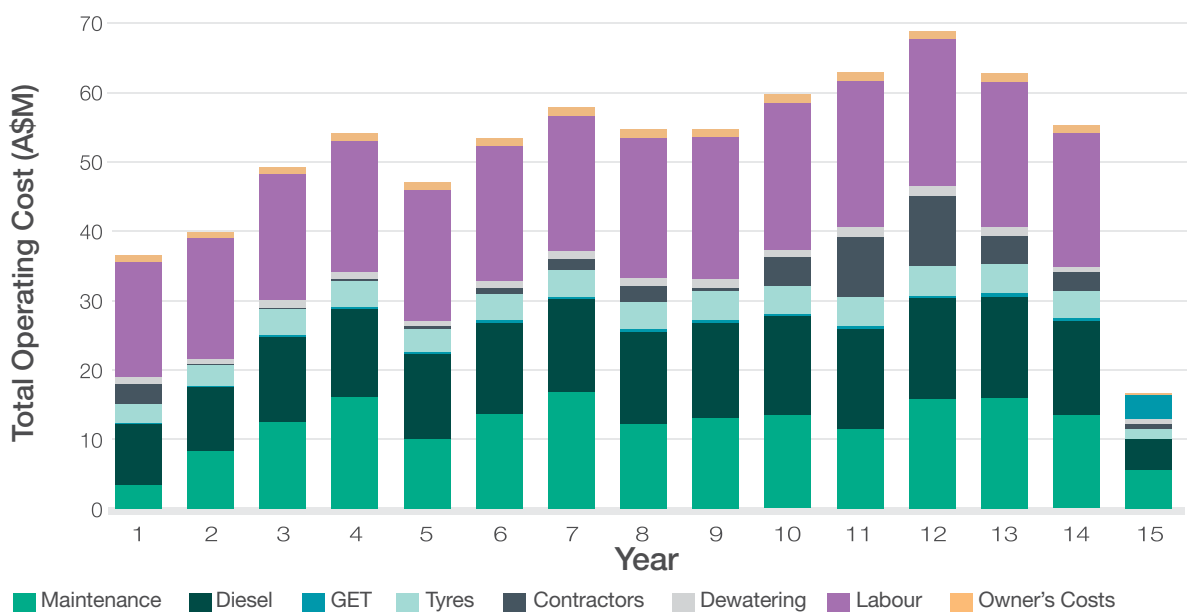


Figure 12.2: Mining Operating Cost Breakdown

LABOUR

The labour costs for the various personnel categories reflect current market labour conditions and site location. The labour rates were obtained from the following sources:

- » Mercer Total Remuneration Survey Q2, 2017;
- » 2016 Hays Salary Guide; and
- » Stellar Salary Guide 2015-2016.

The labour rates are annualised and inclusive of the following on-costs:

- » Superannuation (9.5%); and
- » Payroll tax (6%);
- » Annual leave (4%);
- » Worker's compensation (0.75%);
- » Long service leave provision (2%); and
- » Miscellaneous (4.5%).

Piacentini and Vimy mining crew



A total on-cost of 26.7% has been applied to the salaries as shown above.

An organisational structure and manning schedule has been developed for the MRP to meet planned production targets. The proposed mining, operations and administrative employee numbers are presented in Table 12.3.

The salary level for each position reflects current market conditions and the site location. Personnel will reside in Perth or Kalgoorlie, with travel to/from the operation being via chartered aircraft. Employees will work a two week on, one week off roster or an eight days on, six days off roster and leave entitlements have been based on the Commonwealth's Fair Work Act 2009.

Table 12.3: MRP Employee Levels

Position	Employee Numbers
Mine management and supervision	9
Mining technical services	9
Mining operations	120
Mining maintenance	29
Total Mining	167
Process plant management and supervision	18
Process technical services	4
Process plant operations	53
Process plant maintenance	35
Laboratory	19
Logistics	4
HSE and training	7
Administration	15
Accommodation village & aerodrome	25
Total Process Plant	180
Total Site Employees	347

Piacentini excavator



FUEL

As part of investigations undertaken by PCS to determine the most economical option for electricity supply to the MRP, quotations were received from fuel distributors to supply diesel to the MRP inclusive of international and local freight, insurance and handling costs, and margins.

Based on quotations received for diesel supply and delivery as well as the long-term outlook on Singapore Gasoil prices, a diesel price of A\$0.75 per litre delivered (after excise rebate) to MRP inclusive of the fuel tax rebate has been applied to the operating cost estimate.

POWER

Power will be provided to the MRP via a power station located on the site adjacent to the process plant, under a build, own, operate (BOO) contract. A preliminary tender to provide power to the MRP was issued by PCS to eight potential BOO power providers under a ten-year contract term.

The all-in electrical energy unit cost for the MRP has been estimated at A\$225 per MWh, based on the diesel fuel price of A\$0.75 per litre (after excise rebate).

REAGENTS AND CONSUMABLES

Reagents and consumables include the following cost elements:

- » Mineral sizer (e.g. roller teeth);
- » Log washer (e.g. paddles);
- » Grinding mill (e.g. liners);
- » Grinding media for the grinding mill;
- » Screen consumables;
- » Product drums and bulk bags;
- » All reagents used in the process;
- » Fuel for mobile equipment assigned to the processing or maintenance groups;
- » Fuel for the steam boiler; and
- » Lubricants, operating tools and equipment, general and operator supplies.

Reagent addition rates were derived from laboratory testwork, vendor testing and DFS piloting. Reagent and steam consumption rates have been calculated on a per tonne of leach feed or per pound of recovered uranium basis, from the steady state mass and energy balance developed using Kenwalt SysCAD software for the MRP process plant.

MAINTENANCE

Maintenance costs include the cost for spare parts and maintenance consumables necessary to maintain the process plant.

Maintenance costs also include costs for contract re-lining of the grinding mill, plant shutdowns, airstrip maintenance, main access and internal road maintenance, and maintenance to the borefield track.

The direct labour cost for maintenance personnel is included in the labour cost category.

LABORATORY

Laboratory costs include the costs for assaying of various process streams and mining grade control through the on-site laboratory.

The number of mine grade control assays was calculated based on core samples obtained from 20m x 20m drill spacing. The number of process plant assays has been calculated based on selected process streams and required frequency to monitor the process plant operation, undertake metallurgical accounting and confirm final product specifications.

The MRP laboratory will be operated under a contract service agreement to assay an estimated 77,500 samples per year. The direct labour cost for laboratory personnel has been included in the contracted price. Costs associated with laboratory personnel flights, messing, and accommodation have been included in the general and administration cost category.

GENERAL AND ADMINISTRATION

General and administration costs have been categorised into the following sub-areas:

- » General expenses; and
- » Contract expenses.

General expenses relate to personnel and site office costs and include:

- » Safety and training;
- » Travel;
- » Software and computing;
- » Office supplies;
- » Vendor support;
- » Government fees and other charges;
- » Insurance;

- » Recruitment;
- » General equipment hire (e.g. vehicles); and
- » Communications.

Contract expenses include:

- » Laboratory contract fees;
- » Consultant fees and environmental monitoring costs;
- » Shutdown contract labour;
- » Product freight costs;
- » Port costs;
- » Camp accommodation and messing; and
- » Chartered flights to and from Perth.

SUSTAINING CAPITAL

Sustaining capital is the ongoing cost required to sustain mobile and fixed assets and includes costs related to:

- » Replacement of equipment that has reached the end of life;
- » Major maintenance of plant and infrastructure;
- » Capital for mining infrastructure as the mining operation expands; and
- » Incremental debottlenecking of the process plant to maintain nameplate uranium production capacity as the uranium grade decreases in the latter part of the mine schedule.

The total LOM sustaining and deferred capital, presented in Table 12.4, has been estimated by GRES at A\$159.1M, equivalent to A\$3.38/lb U₃O₈ (US\$2.36/lb). Sustaining capital has been included in the AISC operating costs provided in Table 12.1.

Table 12.4: Sustaining Capital Cost Estimate

Sustaining Capital Item	Sustaining Capital Cost Per Year (A\$M)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
Mining	-	-	11.4	5.6	0.1	2.7	1.1	17.1	6.2	10.7	9.5	2.0	0.7	0.1	-	67.3
Process Plant & Infrastructure	0.8	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	-	24.0
Mobile Equipment	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	1.9
Deferred Capital	0.0	4.5	1.5	0.1	0.7	2.3	7.4	8.8	5.3	13.0	9.5	3.4	0.5	6.6	-	63.4
Road & Airstrip Re-Sheeting	-	-	-	0.1	-	-	1.1	0.1	-	-	-	0.1	1.1	-	-	2.5
Total Sustaining Capital	0.9	6.4	14.8	7.7	2.7	6.9	11.5	27.9	13.4	25.7	20.9	7.3	4.2	8.7	-	159.1

ROYALTIES

Western Australia has a 5% royalty on uranium production, which is estimated to provide the State with approximately A\$14.2M per annum of revenue over the LOM of the MRP (based on the base case uranium price and exchange rate used in this study).

In addition to the WA State royalty, Vimy granted Resource Capital VI L.P. (RCF VI) a mineral royalty of 1.15% of gross revenue from all products produced from the MRP, for an A\$10M cash payment which formed part of a funding package with RCF VI finalised in August 2015.

PREVIOUS OPERATING COST COMPARISON

A comparison of the change in the LOM C1 operating cost estimate developed for the DFS, at US\$27.95/lb U₃O₈, to that released to the market in November 2015 for the PFS, at US\$31.34/lb U₃O₈ (after base metals by-product credits), is presented in Figure 12.3.

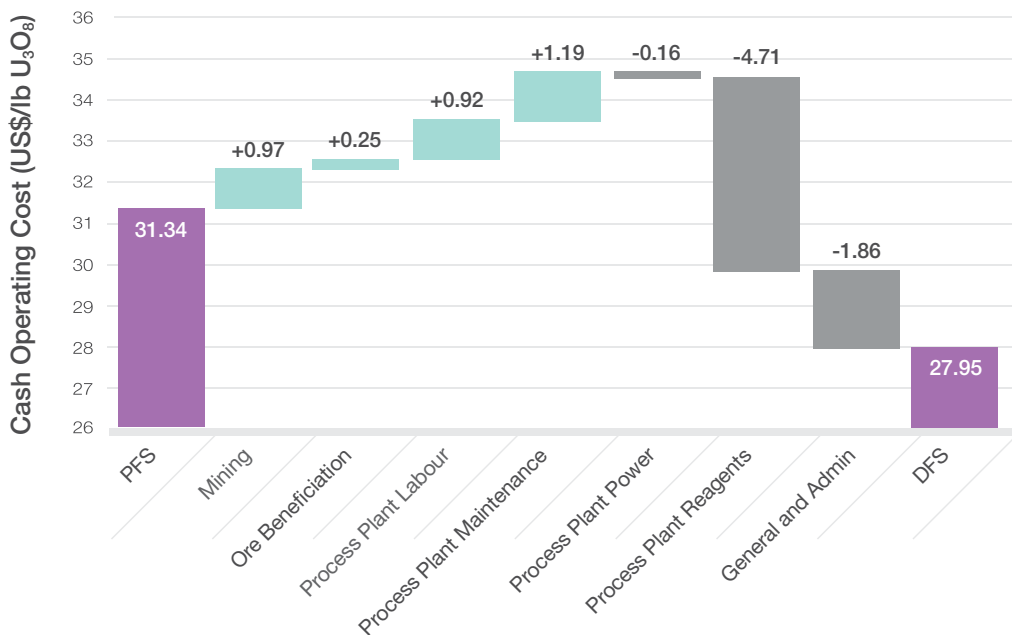


Figure 12.3: Comparison of DFS vs PFS Cash Operating Cost Estimate

The DFS LOM cash operating cost has reduced by US\$3.40/lb U₃O₈ from the PFS cost estimate, with the following cost centres being responsible for the overall 12% reduction in cost:

- » Mining costs have increased by US\$0.97/lb, due to a revision of overburden in-situ wet bulk densities and increased accuracy of surface topography;
- » Ore beneficiation costs have increased marginally by US\$0.25/lb, primarily due to additional maintenance consumables for the mineral sizer and log washer;
- » Process plant labour costs have increased by US\$0.92/lb, due to additional manning and increase in salaries;
- » Process plant maintenance costs have increased by US\$1.19/lb, due to higher maintenance assumptions which are reflective of the corrosive process conditions;
- » Process plant reagent costs have decreased by US\$4.70/lb, as a result of the sulphuric acid plant being incorporated into the project; and
- » General and administration costs have decreased by US\$1.86/lb, primarily due to lower competitive quotations received for accommodation, flights and freight services.



Ambassador West test pit - job done.