

Engineering Summary Report for the REE Phase 2 Bankable Feasibility Study

Project Alkali

Project Number 44191017

Confidential Project

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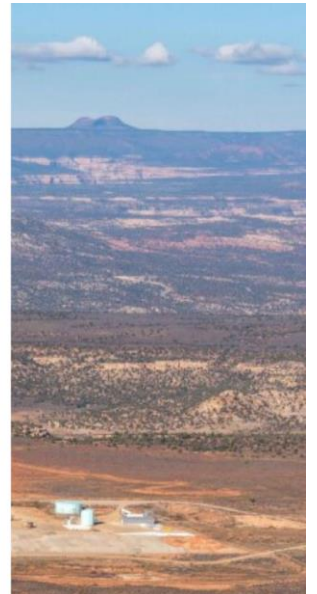
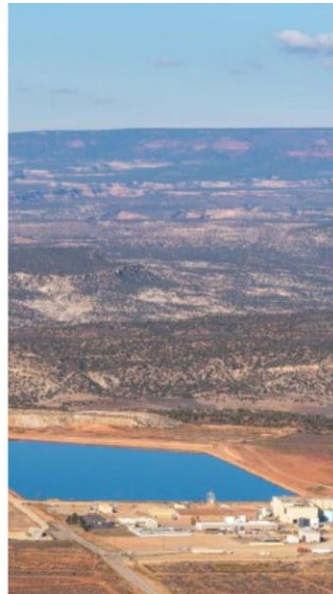
Prepared for
Energy Fuels Inc.

Prepared by
Barr Engineering Co.

January 2026

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Date and Signature Page

This engineering summary report for the REE phase 2 bankable feasibility study is effective as of the 14th day of January, 2026.

Original signed and sealed on file

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January 14, 2026

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Date

Abbreviations, Acronyms, and Units

°C	degrees Celsius
°F	degrees Fahrenheit
5N	5 normal
AACE	Association for the Advancement of Cost Engineering
ac	acre
Adamas	Adamas Intelligence Inc
ASCE	American Society of Civil Engineers
Barr	Barr Engineering Co.
BFS	bankable feasibility study
BOD	basis of design
Btu	British thermal unit
C&L	crack and leach
CAGR	compound annual growth rate
CAPEX	capital expenditure
Ce	cerium
cfm	cubic feet per minute
CIM	Canadian Institute of Mining, Metallurgy, and Petroleum
cm	centimeters
CO	carbon monoxide
CO ₂	carbon dioxide
CO _{2e}	carbon dioxide equivalent
d	day
Dy	dysprosium
EF	Energy Fuels Inc.
EHS	environmental, health, and safety
EPD	environmental product declaration
Er	erbium
ESR	engineering summary report
Eu	europium
EV	electric vehicle
FMEA	failure mode and affects analysis
FOB	free on board
ft	feet/foot
ft ²	square feet
g	gram
g/L	grams per liter
g/t	grams per tonne
gal	gallon
GC	general contractor
Gd	gadolinium
GHG	greenhouse gas
gpm	gallons per minute
GWP	global warming potential

h	hour
HAZOP	hazard and operability analysis
HCl	hydrochloric acid
HDPE	high-density polyethylene
HMI	human machine interface
Ho	holmium
Ho+	mixture of heavy RE elements commonly holmium/europium/lutetium/ytterbium/yttrium
hp	horsepower
HREE	heavy rare earth element
HREO	heavy rare earth oxide
HVAC	heating, ventilation, and air conditioning
IRR	internal rate of return
ISO	International Organization for Standardization
k	thousand
kg	kilogram
km	kilometer
kPa	kilopascal
kt	kilotonne
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
L	liter
L/min	liters per minute
La	lanthanum
La/Ce	lanthanum/cerium
lb	pound
LCA	life cycle assessment
LCI	life cycle inventory
LCIA	life cycle impact assessment
LNG	liquefied natural gas
LOPA	layers of protection analysis
LREE	light rare earth element
LREO	light rare earth oxide
Lu	lutetium
m	meter
M	million
m ³	cubic meter
m ³ /h	cubic meters per hour
MCC	motor control center
MMBtu/h	million British thermal units per hour
MOC	management of change
Monazite	RE-bearing uranium ore feed
MSHA	United States Mine Safety and Health Administration
Mst	Million short tons (US)
Mt	Million tonnes (metric)

MW	megawatt
MWh	megawatt hour
NdFeB	neodymium iron boron
NdPr	neodymium/praseodymium
NFPA	National Fire Protection Association
Nm ³ /h	normal cubic meters per hour
NPV	net present value
OPEX	operational expenditure
OSHA	United States Occupational Safety and Health Administration
P&ID	piping and instrumentation diagram
PCR	product category rules
PDC	process design criteria
PEMB	pre-engineering metal building
PEP	project execution plan
PFD	process flow diagram
PHA	process hazard analysis
PLC	programmable logic controller
PLS	pregnant leach solution
Pm	promethium
Pr	praseodymium
psf	pounds per square foot
psia	pounds per square inch absolute
psig	pounds per square inch gauge
PSM	Process Safety Management
QP	Qualified Person
Ra	radium
RE	rare earth
REE	rare earth element
REO	rare earth oxide
REPM	rare earth permanent magnets
s	seconds
SCFM	standard cubic foot per minute
SEC	United States Securities and Exchange Commission
SEG	mixed samarium/europium/gadolinium
Sm	samarium
Sm+	samarium (Sm) and other RE elements with higher atomic weights
SPT	standard penetration tests
st or ton	U.S. short ton (2,000 lb)
stpa	tons per annum (US)
stpd	tons per day (US)
stph	tons per hour (US)
SX	solvent extraction
t or tonne	metric tonne (1,000 kg)
Tb	terbium
Th	thorium

the mill	White Mesa Mill
Tm	thulium
tpa	tonnes per annum (metric)
tpd	tonnes per day (metric)
tph	tonnes per hour (metric)
TradeTech	TradeTech LLC
TREO	total rare earth oxides
U	uranium
U.S. or US	United States
U ₃ O ₈	triuranium octoxide (also called yellowcake)
UDOT	Utah Department of Transportation
UPS	uninterruptible power supply
USCS	Unified Soil Classification System
UV	ultraviolet
V	volt
VAT	Value Added Tax
VFDs	variable frequency drives
WBS	work breakdown structure
WMM	White Mesa Mill
y	year

1 Executive Summary

This engineering summary report (ESR) has been prepared by Barr Engineering Co. (Barr) to summarize and present the results of a REE phase 2 bankable feasibility study (BFS) for Energy Fuels Inc.'s (EF) Project Alkali. The Project Alkali BFS was commissioned in February 2025 by EF (NYSE American: UUUU) headquartered at 225 Union Blvd., Suite 600, Lakewood, Colorado 80228.

The scope of the Project Alkali BFS includes the following:

- Design of the crack and leach (C&L), solvent extraction (SX), and product finishing plants for each product stream
- Design of plant infrastructure including electrical power distribution, natural gas, plant utilities, and reagent storage and handling
- Evaluation of existing maintenance and storage facilities for renovation and/or expansion
- Design of a new access road to the rare earth (RE) plant facility
- Design of a new administrative building located near the RE facilities
- Design of dedicated RE laboratory facilities
- Evaluation of ancillary facility requirements including, but not limited to, restrooms, changing rooms, break rooms, lunch spaces, and general storage
- Life cycle assessment (LCA) of products generated by the facilities included within the scope of the project; primary interest for LCA results include carbon dioxide equivalent (CO₂e) emissions per kilogram (kg) of product consistent with international reporting standards for Scope 1 and Scope 2 emissions
- Association for the Advancement of Cost Engineering (AACE) Class 3 capital and operational cost estimates with an assumed accuracy of +/- 15%
- Project execution plan (PEP) to address the subsequent new facilities detailed design, procurement, and construction, with particular attention given to development of the project through commissioning and handover to EF's White Mesa Mill operations team
- Project schedule for detailed design, procurement, and construction of the new facilities
- Project financial analysis for a 50-year project life

The results of this BFS may be used as part of NI 43-101 and/or S-K 1300 reporting, environmental permitting, and solicitation of funding, as well as to inform subsequent detailed engineering of the new facilities.

1.1 Processing and Recovery Methods

The new facilities proposed for Project Alkali will process monazite sand using a sequence of C&L, SX, and final product finishing. Monazite feedstock is expected to be processed as received without additional crushing or grinding. After drying, the finished products will be stored for dispatch to customers. This study defines the battery limits as beginning with as-received monazite sand and reagents and ending with finished products packaged in super sacks or barrels, prepared for offsite shipment.

1.3 Capital and Operating Costs

Capital and operating costs were estimated in 2025 U.S. dollars for detailed design, construction, installation, and commissioning of all facilities specified in the BFS. The capital cost estimate was prepared in accordance with:

- Guidance provided by the Canadian Institute of Mining, Metallurgy, and Petroleum (CIM) under the guidelines of Canadian National Instrument 43-101 Technical Reporting (National Instrument 43-101, 2011).
- Guidance provided by the United States Securities and Exchange Commission (SEC) regulation S-K 1300 regarding disclosure of feasibility study results (U.S. Securities and Exchange Commission, 2018). Specifically, to qualify as a Feasibility Study, the capital costs must have an accuracy level of +/- 15% with a contingency range not exceeding 10%.

1.3.1 Capital Costs

Vendor quotes were obtained for approximately 89% of the major equipment capital cost across the project areas, with the balance derived from EF and other sources. General construction direct costs were provided by contractors who derived their estimates from the feasibility study general arrangements and material takeoffs. The administration building design and construction cost was prepared by an architectural and engineering firm.

The total estimated capital cost of the project is summarized in Table 1-1.

Table 1-1 Estimated Project Capital Costs

Description	Initial Capital Cost (\$ M)
Sitework - Roads and Building Areas	14.2
Administration Building	14.8
Area 100: Monazite Storage and Dry Caustic Storage	10.0
Area 200: Crack and Leach	52.1
Area 300: Solvent Extraction and Separation	75.5
Area 400: Product Finishing including NdPr	75.1
Area 500: Product Storage	3.2
Area 600: Reagents Receiving and Storage	20.4
Area 700: Utilities	18.6
Area 999: Water and Potable Water	4.9
Total Direct Costs	288.8
Indirect Costs	48.7
Owner's Cost	35.3
Total Direct, Indirect and Owner's Costs	372.8
Contingency at 10%	37.2
Total Initial Capital Cost	410.0
-15% Accuracy	-61.5
+15% Accuracy	+61.5
Capital Estimate Range	348.5 – 471.5

Note. \$ M = millions of U.S. dollars

1.3.2 Operating Costs

Operating costs were prepared in collaboration with EF White Mesa Mill operations management. A summary of operating costs is listed in Table 1-2. Unit costs for each line item shown are based on annual planned monazite feed rate of 55,100 short tons per year (stpa) (50,000 metric tonnes per year [tpa]).

Table 1-2 Operating Cost Summary

Item	\$ Per Annum	Monazite Feed (\$ Per Short Ton)
Utilities	11,974,000	217
Consumables (Reagents)	131,024,000	2,378
Fixed Costs	23,212,000	421
Total Operating Costs	166,210,000	3,017

1.4 Economic Evaluation

The economic evaluation is based on the sale of the recovered RE and triuranium octoxide (U_3O_8) products from monazite ore (sand) received at the White Mesa Mill from heavy mineral sand operations. The capital and operating costs estimates for Project Alkali were developed for the processing facility with the following included in the consideration:

- Sourcing cost associated with the supply of monazite ore from multiple sources
- Cost of shipping the monazite ore feed from various sources to the White Mesa Mill

The economic analysis is based on the following assumptions:

- Discount rate of 8%
- 40 years of production
- Cost escalation of 2.5% annually
- Product price forecast with 2.5% annual escalation
- Annual monazite production of 50,000 t
- 1% royalty for San Juan County Clean Energy Foundation (net revenue basis less monazite supply costs)
- Results are based on 100% EF ownership

Table 1-3 outlines the product prices used in the economic analysis. Price assumptions for a mixture of heavy rare earth (RE) elements—commonly holmium (Ho), europium (Eu), lutetium (Lu), ytterbium (Yb), and yttrium (Y)—as carbonate, and mixed samarium (Sm), europium (Eu), and gadolinium (Gd), collectively referred to as SEG, as carbonate, are based on 70% payability of the contained REO equivalent.

Table 1-3 Project RE Product Pricing (includes 2.5% escalation)

Product	Unit	2026	2027	2028	2029	2030	2040	2050	2060	2068
NdPr Oxide	\$/kg	75	85	90	94	97	167	214	274	334
Dy Oxide	\$/kg	251	289	323	359	373	572	732	937	1,142
Tb Oxide	\$/kg	1,051	1,156	1,287	1,352	1,443	2,230	2,855	3,655	4,453
Ho+ Carbonate	\$/kg	0	0	0	11	12	15	20	25	31
SEG Carbonate	\$/kg	0	0	0	12	13	22	29	37	48
U ₃ O ₈	\$/lb	96	97	106	112	117	180	230	295	359

Source: TradeTech LLC (2025)

Note. kg = kilogram, lb = pound, \$ = USD

The project has been evaluated on an after-tax basis to provide a more indicative (but still approximate) value for potential project economics. The tax model contains the following assumptions:

- Federal Income Tax: 21%
- Utah State Income Tax: 4.5%
- San Juan County Taxes: \$550,000 annually in 2025 and \$1,000,000 estimate in 2030 with 2.5% annual escalation after 2030

Total taxes for the project amount to \$4,019 M over the project life.

The financial results indicate a pre-tax net present value (NPV) of \$2,601 M at a discount rate of 8%, an internal rate of return (IRR) of 37%, and a payback period of 6.2 years. Table 1-4 summarizes the results.

Table 1-4 Financial Results of the Project

Economic Highlights	Unit	Value
Total Revenue	\$ M	61,099
Total Operating Costs	\$ M	43,266
Initial Capital Costs	\$ M	437
Sustaining Capital Costs	\$ M	1,564
Closure/Reclamation Costs	\$ M	29
Total Pre-Tax Cash Flow	\$ M	15,802
Pre-Tax NPV at 5%	\$ M	4,701
Pre-Tax NPV at 8%	\$ M	2,601
Pre-Tax NPV at 10%	\$ M	1,830
Pre-Tax IRR	%	37%
Pre-Tax Payback Period	years	6.23
After-Tax Cash Flow	\$ M	11,783
After-Tax NPV at 5%	\$ M	3,490
After-Tax NPV at 8%	\$ M	1,918
After-Tax NPV at 10%	\$ M	1,340
After-Tax IRR	%	33%
After-Tax Payback Period	years	6.36

Note. IRR = internal rate of return, NPV = net present value, \$ M = millions of U.S. dollars

Figure 1-3 illustrates the project's pre-tax and after-tax cash flow and cumulative cash flow profile.

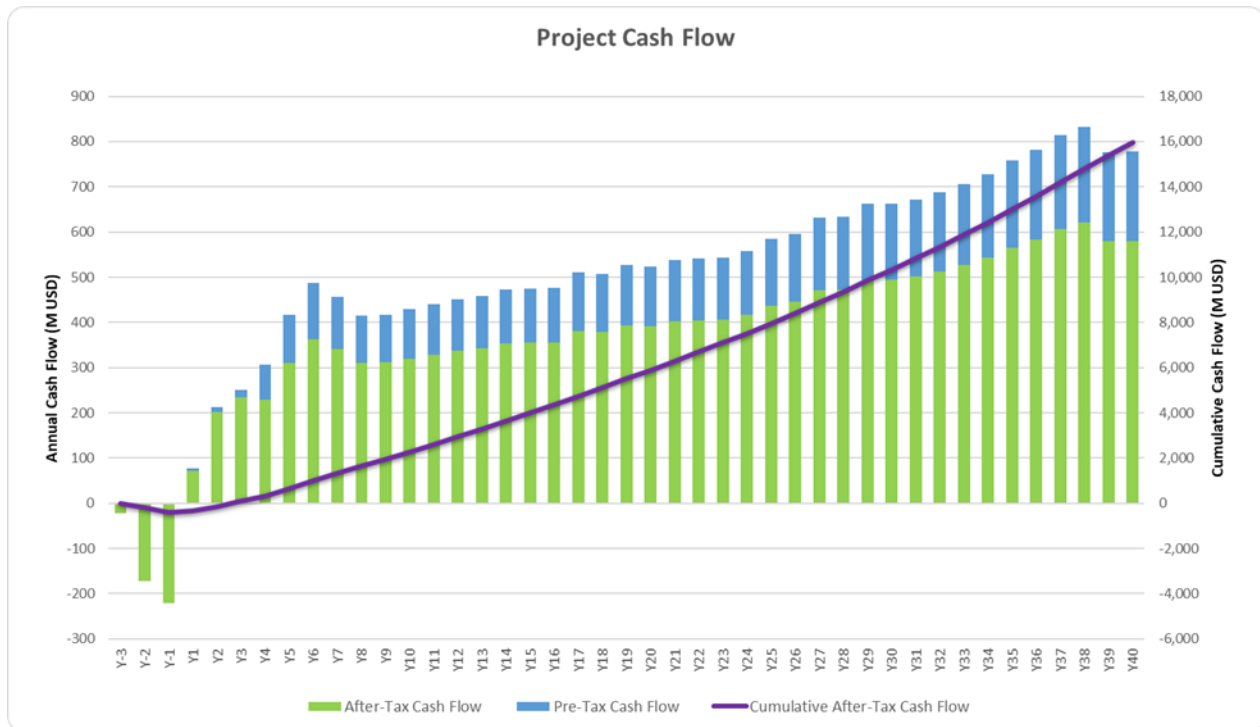


Figure 1-3 Pre-Tax and After-Tax Cash Flow and Cumulative Cash Flow Profile of the Project

A univariate sensitivity analysis revealed that the project NPV and IRR are most sensitive to product prices and annual production, with moderate sensitivity to the accuracy of the operating cost estimate and limited sensitivity to the accuracy of the capital cost estimate. The project after-tax NPV and IRR sensitivities are indicated in Figure 1-4 and Figure 1-5 respectively.

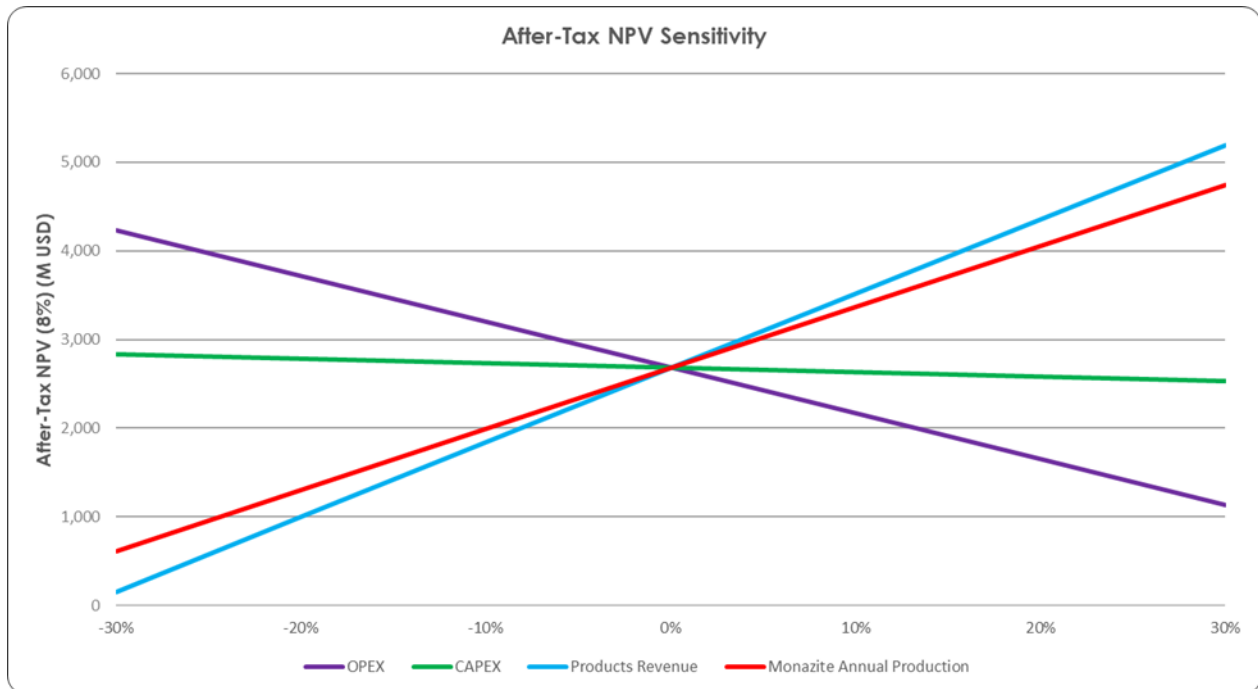


Figure 1-4 After-Tax NPV Sensitivity

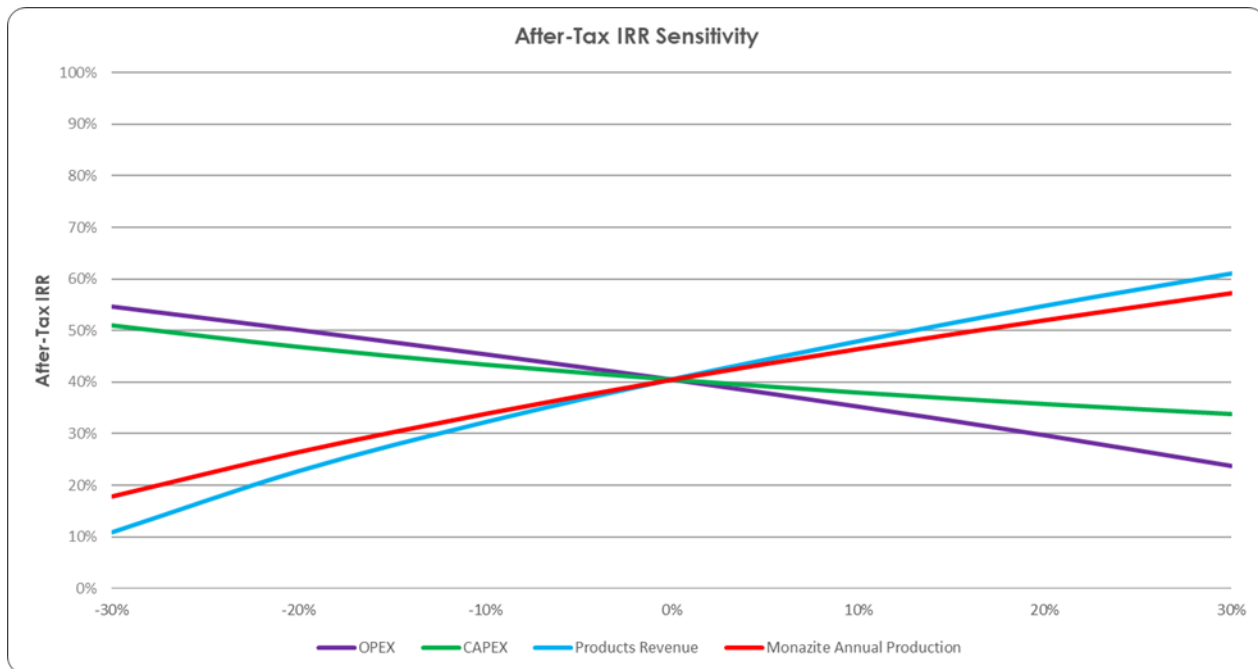


Figure 1-5 After Tax IRR Sensitivity

5 Market Studies

Project Alkali is expected to provide value in the form of several RE products along with a U_3O_8 product through the treatment of concentrated uranium slurry from the RE process. The following sections describe the forward-looking market assumptions used to prepare the subsequent economic analysis in chapter 7 of this BFS. Price forecasts were provided by Adamas Intelligence Inc. (Adamas) via its Rare Earth Pricing Quarterly Outlook report (Q4 2025) and a proprietary uranium market study prepared by TradeTech LLC (TradeTech) for EF.

5.1 Monazite Feed Payabilities

Global purchases of monazite concentrates are typically priced based on the payability of the contained REOs. Monazite TREO payabilities for Project Alkali, based on EF Toliara and third-party sources used in the economic analysis, align with recent high-grade monazite benchmarks from China (60% TREO), as shown in Figure 5-1. The payability for Donald is based on a joint venture agreement between EF and Astron Corporation Limited.

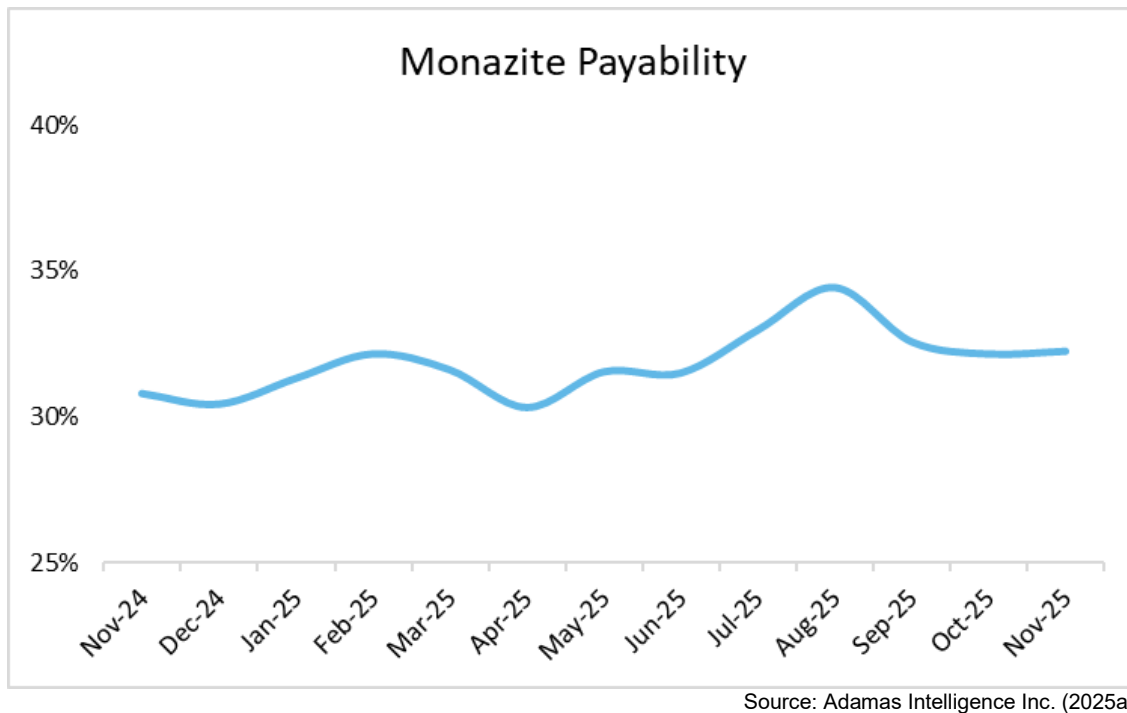


Figure 5-1 Historic Monazite Payabilities (Rolling 12-Month Period)

5.2 Rare Earth Market Summary

REEs are comprised of 17 elements that include the lanthanide series of 15 elements plus yttrium and scandium. Despite the name, they are not rare but rather are rarely concentrated into economically significant amounts for extraction and processing.

The REEs are generally further differentiated into light REEs (LREE) or light REOs (LREO) and heavy REEs (HREE) or heavy REOs (HREO) based on their outer electron configuration. LREEs include La, Pr, Nd, Sm, Ce, Eu, promethium (Pm), and sometimes Gd, while HREEs include Tb, Dy, Ho, erbium (Er), lutetium (Lu), and thulium (Tm). Yttrium is classified as a REE because of its similar chemical properties and scandium is included because it is naturally found in many of the same minerals as the lanthanides (Adamas, 2025a).

There is higher abundance of LREOs on earth than the HREOs as the LREOs collectively make up over 90% of the TREO content in a typical rare earth deposit (Adamas, 2025a).

REEs exhibit special magnetic and conductive properties and have become necessary components across a wide range of technological applications including hybrid and electric vehicles (EV), consumer products, industrial products, and defense applications. These are categorized as critical materials to indicate their commercial and strategic importance throughout the world.

End uses for REEs are generally classified into the eight categories shown in Table 5-1.

Table 5-1 REE End-Use Categories Defined by Adamas Intelligence Inc.

End-Use Category	Description
Battery Alloys	Rare earth elements are used to produce anode materials for nickel-metal hydride (NIMH) batteries, NIMH batteries are used in hybrid electric vehicles, consumer electronics, cordless shavers, cordless power tools, baby monitors, and other applications of rechargeable batteries
Catalysts	Rare earth elements, such as cerium and lanthanum, are used in catalytic converters of gasoline and diesel-powered vehicles, as well as fuel cracking catalysts and additives used by oil refiners to break down crude oil into lighter distillates, such as gasoline, diesel, kerosene and more
Ceramics, Pigments, and Glazes	Rare earth elements are used to produce decorative ceramics, functional ceramics, structural ceramics, bio ceramics, and many other types of ceramics used in everything from jet engine coatings to ceramic cutting tools, dental crowns, ceramic capacitors, ceramic tiles, and more
Glass Polishing Powder and Additives	Rare earth elements, such as cerium, are used to polish optical glass, hard disk drive platters, LCD display screens, and gemstones, among a long list of applications. Cerium is also used as an additive in UV-filtering glass and container glass, whereas lanthanum, yttrium and gadolinium are used to produce high quality optical glass used in camera lenses, microscopes, and telescopes
Metallurgy and Alloys	Rare earth mischmetal (a mixture of light REE metals) is used during production of some types of steel, as well as ductile iron making. Rare earth elements are also used to produce a variety of different alloys, such as ferrocerium, ferro-holmium, ferro-gadolinium, ferro-dysprosium and a growing list of others
Permanent Magnets (focus of this section)	Rare earth elements are used to produce high-strength permanent magnets that have enabled the production of ubiquitous gadgets and electronics, such as mobile phones and laptops, as well as power dense energy-efficient electric motors and generators used in electric vehicles, wind power generators, energy efficient appliances, and hundreds of other applications
Phosphors	Rare earth elements are used in phosphors for energy efficient lamps, display screens and avionics, and are added to fiat currency in some nations as an anticounterfeit measure

End-Use Category	Description
Other	Aside from the above-described end uses and categories, rare earth elements are used in a long list of other end uses and applications, including many in defense, medicine, agriculture, high-tech and chemical industries

Source: Adamas Intelligence research (as cited in Rare Earth Industry Association, n.d.).

According to Adamas Intelligence Inc. (2025a), the RE permanent magnets (REPM) are responsible for over 95% of the total value of global TREO consumption in 2023. Magnetic REE demand is expected to undergo considerable growth with increased uptake in e-mobility (including EVs and hybrid vehicles), robotics, consumer electronics, energy, defense, and other end use segments. Adamas projects that demand for REPMs will rise 11.1% in 2025 to 258,000 t, led by passenger and commercial EV traction motors, wind power generators, and consumer electronics. Adamas forecasts that global demand will increase at a compound annual growth rate (CAGR) of 8.7% through 2040 reaching 897,000 t, driven by double-digit growth from EVs, robotics, and advanced air mobility applications.

The saleable products from the REO expansion at the White Mesa Mill are: (NdPr)₂O₃ or NdPr oxide, Dy₂O₃ or Dy oxide, and Tb₄O₇ or Tb oxide, which are the primary feedstocks to produce neodymium iron boron (NdFeB) REPMs. An NdFeB permanent magnet is the strongest type of permanent magnet material commercially available today in terms of energy product. REPMs are used in hundreds of end-uses and applications, from cell phones to EV traction drive units to advanced defense applications.

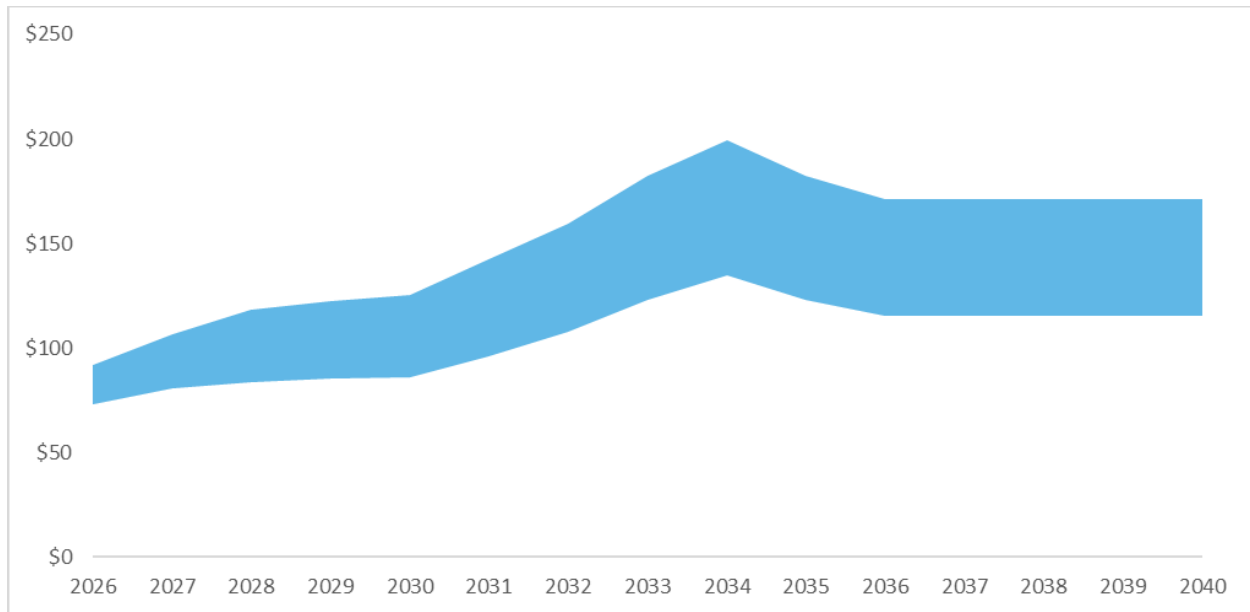
Adamas forecasts that robotics, passenger EV traction motors, advanced air mobility, and car speakers will drive the greatest NdPr oxide demand growth through 2040. NdPr oxide demand is expected to increase by 293,000 t to 420,000 t by 2040 compared to 2025. HREE oxides, such as Dy and Tb oxide, are often added to high-temperature grades of NdFeB alloys to increase the magnet's intrinsic coercivity and resistance to demagnetization.

Dy and Tb have a similar demand outlook as NdPr oxide. Adamas forecasts that Dy oxide demand for passenger EV traction motors, commercial EV traction motors, and other e-mobility applications will nearly triple between 2025 and 2040, bolstered by rising demand for passenger and commercial EVs, which use high-performance temperature-resistant NdFeB magnets containing Dy and/or Tb. Overall, Adamas forecasts that the total global Dy and Tb oxides demand for all end-uses and applications combined will grow from 2,800 t in 2025 to nearly 8,000 t in 2040, more than 5,200 t greater than 2025 demand (Adamas Intelligence Inc., 2025a).

China has dominated both mine production of REE feedstock and processing of refined REE materials. It also controls downstream manufacturing markets, including the high-value magnet sector. Outside China, governments are actively supporting new production to create additional raw material supply chains for REPMs and to reduce reliance on Chinese output. Currently, the majority of NdPr oxide is refined in China. Due to increased geopolitical tensions between China and western jurisdictions and increased supply chain scrutiny, many manufacturers and tiered suppliers are actively pursuing supply options for REE oxides outside of China. The drive to expand and diversify supply chains has encouraged new non-Chinese downstream production and capacity. However, with many projects yet to reach feasibility stage and construction, and lead times remaining long, the demand for ex-China REEs, particularly NdPr, Dy, and Tb required for permanent magnets, is expected to remain high and grow considerably.

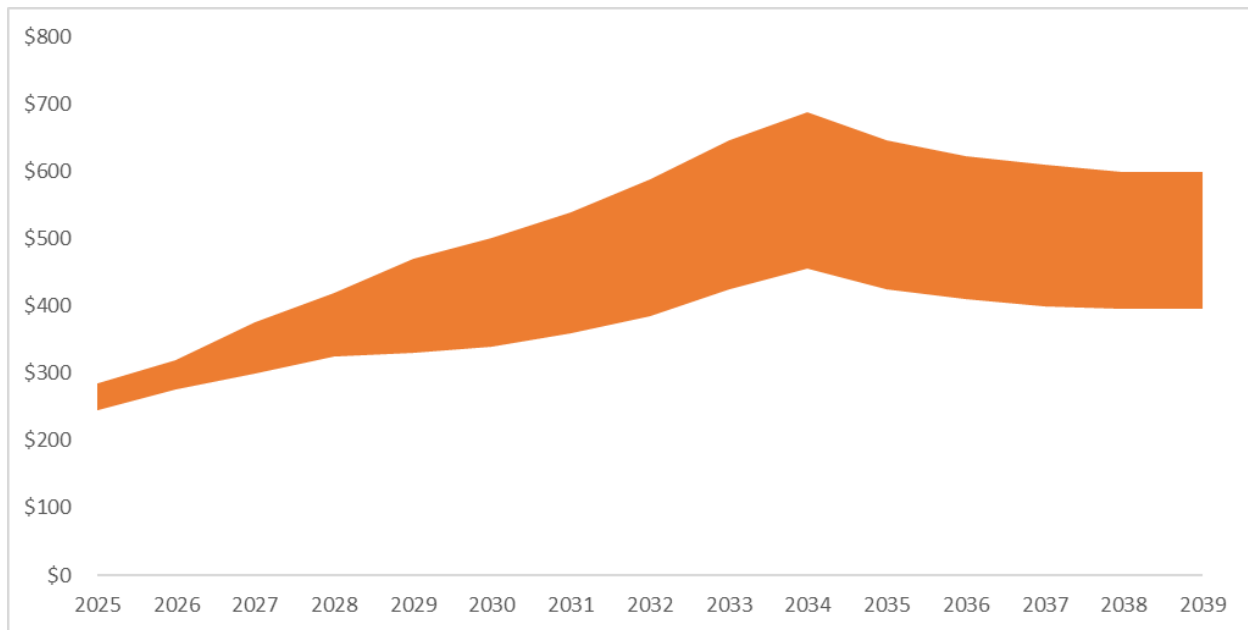
Additional upside may be supported by government policy and regulatory settings, particularly in the European Union (EU) and the U.S., which are aimed at strengthening non-Chinese supply chains.

Figure 5-2 through Figure 5-4 illustrate the Adamas forecast of REE nominal pricing trends for the REE products expected from Project Alkali, namely NdPr oxide, Tb oxide, and Dy oxide. Prices shown are free on board (FOB) China and are inclusive of 13% value added tax (VAT).

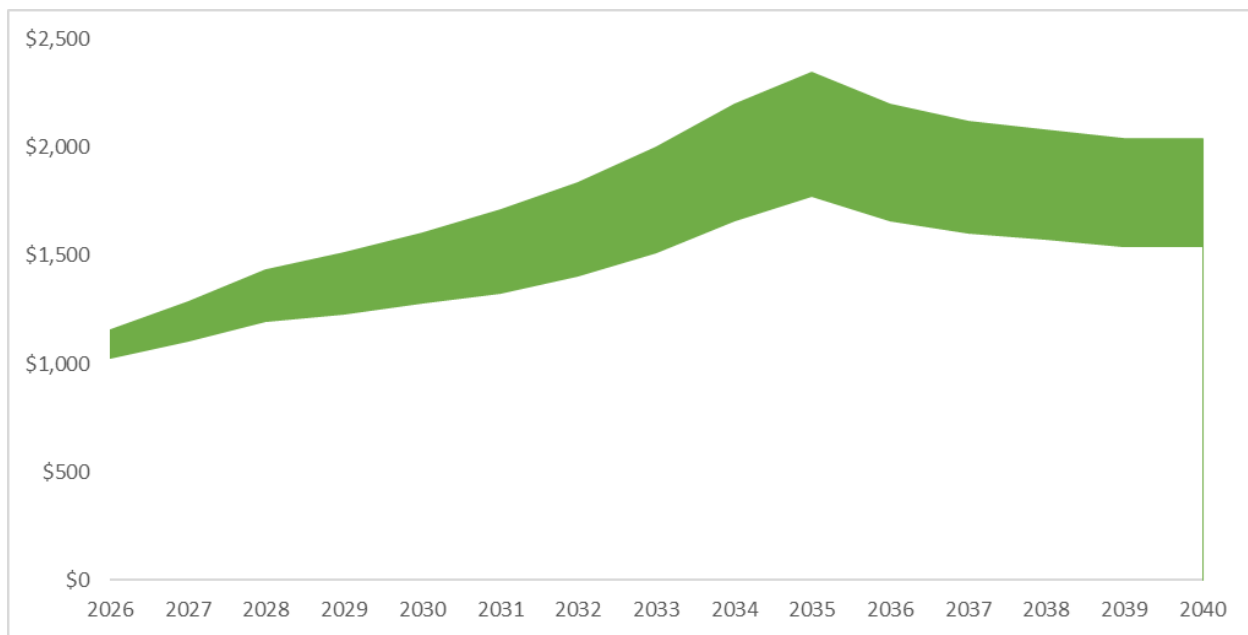


Source: Adamas Intelligence Inc. (2025c)

Figure 5-2 Projected NdPr Oxide Pricing Trends (per kg)



Source: Adamas Intelligence Inc (2025c)

Figure 5-3 Projected Dy Oxide Pricing Trends (per kg)

Source: Adamas Intelligence Inc. (2025c)

Figure 5-4 Projected Tb Oxide Pricing Trends (per kg)

The Adamas base case forecast escalated at 2.5% forms the basis for the product pricing assumptions shown in Table 5-2 that are used for the economic analysis described in chapter 7. The Ho+ carbonate and SEG carbonate price assumptions are based on 70% payability of the contained REO equivalent.

Table 5-2 Project RE Product Pricing (includes 2.5% escalation)

Product	Unit	2026	2027	2028	2029	2030	2040	2050	2060	2068
NdPr Oxide	\$/kg	75	85	90	94	97	167	214	274	334
Dy Oxide	\$/kg	251	289	323	359	373	572	732	937	1,142
Tb Oxide	\$/kg	1,051	1,156	1,287	1,352	1,443	2,230	2,855	3,655	4,453
Ho+ Carbonate	\$/kg	0	0	0	11	12	15	20	25	31
SEG Carbonate	\$/kg	0	0	0	12	13	22	29	37	48

Note. kg = kilogram, lb = pound, \$ = USD

5.3 Uranium Market Summary

The following U₃O₈ market outlook was included in the EF November 3, 2025, 10-Q report filed with the SEC.

The Company believes that uranium supply pressure and demand fundamentals point to higher sustained uranium prices in the future and that the advancement of reliable nuclear energy, fueled by uranium, is experiencing a global resurgence with an increased focus by governments, policymakers, technology companies and citizens on decarbonization, electrification and security of energy supply. In addition, a number of factors, including restrictions on Russian uranium products in the U.S., transportation challenges, trade policies, production challenges and financial entities purchasing uranium to hold for an extended period has the potential to result in higher sustained spot and term prices and to potentially induce utilities to enter into additional long-term contracts with non-Russian producers, such as Energy Fuels. Those factors additionally have the potential to foster security of supply, the avoidance of transportation and logistics issues and more certain pricing. Indeed, the past two years have seen the highest levels of long-term contracting by utilities since 2012, according to TradeTech.

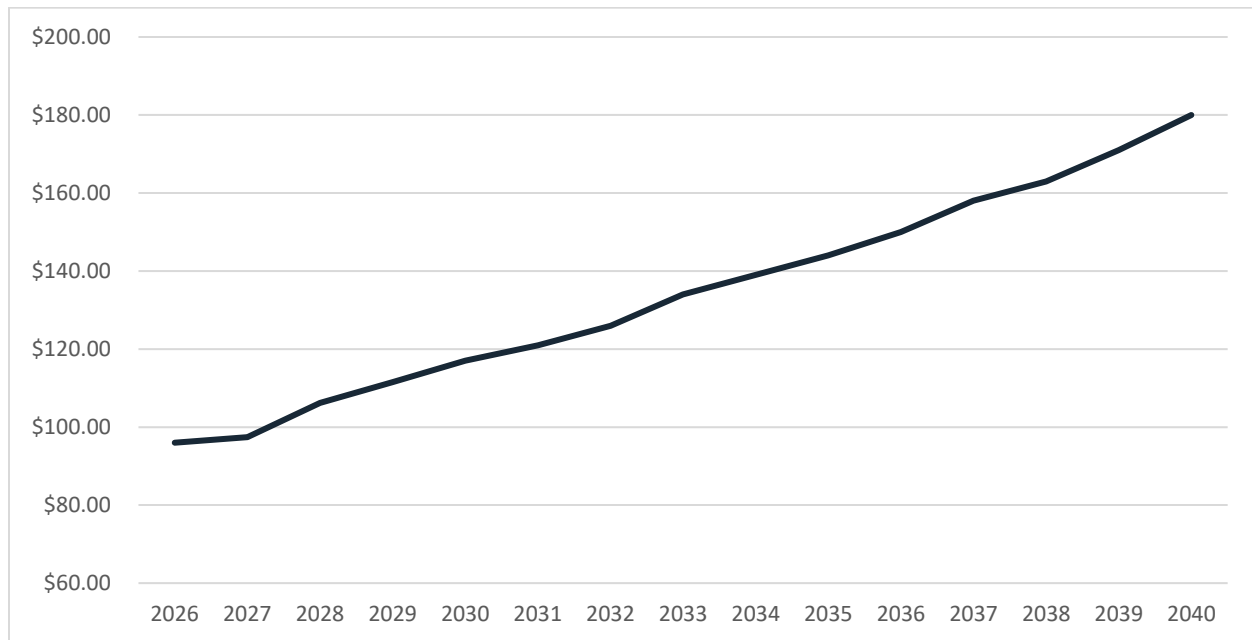
The forecast for U₃O₈ pricing used in the economic analysis, including 2.5% escalation, is summarized in Table 5-3, which shows forecast pricing trends based on the TradeTech LLC (2025) analysis.

Table 5-3 Project U₃O₈ Product Pricing (includes 2.5% escalation)

Product	Unit	2026	2027	2028	2029	2030	2040	2050	2060	2068
U ₃ O ₈	\$/lb	96	97	106	112	117	180	230	295	359

Source: TradeTech LLC (2025)

Note. kg = kilogram, lb = pound, \$ = USD



Source: TradeTech LLC (2025)

Figure 5-5 U₃O₈ Product Pricing Trends (Nominal \$ per Pound)

6 Capital and Operating Costs

Capital and operating costs were estimated for detailed design, construction, installation, and commissioning of all facilities specified in the BFS. All capital costs included within this chapter are expressed in 2025 U.S. dollars.

6.1 Capital Costs

The capital cost estimate described in this section was prepared in accordance with:

- Guidance provided by the Canadian Institute of Mining, Metallurgy, and Petroleum (CIM) under the guidelines of Canadian National Instrument 43-101 Technical Reporting (National Instrument 43-101, 2011).
- Guidance provided by the United States Securities and Exchange Commission (SEC) regulation S-K 1300 regarding disclosure of feasibility study results (U.S. Securities and Exchange Commission, 2018). Specifically, to qualify as a Feasibility Study, the capital costs must have an accuracy level of +/- 15% with a contingency range not exceeding 10%.

The total estimated capital cost of the project is summarized in Table 6-1 below.

Table 6-1 Estimated Capital Costs

Description	Initial Capital (\$ M)
Sitework – Roads and Building Areas	14.2
Administration Building	14.8
Area 100: Monazite Storage and Dry Caustic Storage	10.0
Area 200: Crack and Leach	52.1
Area 300: Solvent Extraction and Separation	75.5
Area 400: Product Finishing including NdPr	75.1
Area 500: Product Storage	3.2
Area 600: Reagents Receiving and Storage	20.4
Area 700: Utilities	18.6
Area 999: Water and Potable Water	4.9
Total Direct Costs	288.8
Indirect Costs	48.7
Owner's Cost	35.3
Total Direct, Indirect, and Owner's Costs	372.8
Contingency at 10%	37.2
Total Initial Capital Cost	410.0
-15% Accuracy	-61.5
+15% Accuracy	+61.5
Capital Estimate Range	348.5 – 471.5

Note. \$ M = millions of U.S. dollars

The basis for each of these line items is described in the subsections that follow.

6.1.1 Direct Costs Summary

6.1.1.1 Major Equipment Costs

Vendor quotes were obtained for approximately 89% of the major equipment capital cost across the project areas, with the balance derived from EF and other sources. This represents a high fidelity of major equipment cost overall. A special fire detection and foam suppression system was estimated as a major equipment cost and is included for area 300 solvent extraction and separation. Area 700 utilities includes two low pressure steam boilers and a compressed air system for plant air and instrument air. Area 999 includes a new potable water system, new water wells, well water storage, and pumps with three miles (4.8 kilometers) of combined buried piping from the wells to the new facility. Mobile equipment includes forklifts, flatbed truck for hauling bulk bags, and light utility vehicles for maintenance and personnel transport. Major equipment costs are summarized in Table 6-2 below.

Table 6-2 Major Equipment Costs

Major Equipment Area	Initial Capital (\$ M)
Area 200: Crack and Leach	13.3
Area 300: Solvent Extraction and Separation	18.3
Area 400: Product Finishing including NdPr	32.3
Area 600: Reagents Receiving and Storage	7.7
Area 700: Utilities	5.8
Area 999: Water and Potable Water	4.5
Mobile Equipment	0.7
Total Major Equipment Costs	82.6

Note. \$ M = millions of U.S. dollars

6.1.1.2 General Construction Costs

Wollam Construction based in Draper, Utah, prepared the general construction cost estimate which includes all supervision, labor, construction equipment, and required materials as specified to complete the general construction portion of this project. The general construction estimate does not include electrical construction which is described in section 6.1.1.3 or administration building construction which is described in section 6.1.1.4. This estimate was developed based on the following:

- It is assumed a single general contractor (GC) will manage all construction activities (except for the two evaporation cells)
- The GC will self-perform all civil, mechanical, and structural construction specified by the general arrangements, material takeoffs, piping details, and equipment lists developed for the BFS with an electrical subcontractor overseeing electrical construction
- Estimate is based on the civil, mechanical, and structural general arrangement drawings and details, material takeoffs, piping information, and equipment lists developed for the BFS

- The GC will install all owner supplied equipment, with the exception of tanks larger than 14 feet (4.3 meters) in diameter which are installed by the tank supplier (installation cost is included in the supplier quotation)
- Scope of estimate includes installation of all foundations, including those required for electrical substation equipment, but not foundation required for the administration building which is included in a section 6.1.1.4
- Scope includes all buildings except for the administration building which is included in a section 6.1.1.4
- Estimates for all PEMB are based on current pricing quotes from a PEMB supplier (with installation by the GC)
- Estimates for pipe materials based on a combination of quotes and current pricing
- Estimates for other materials based on current pricing
- Full time GC project management and safety team for the duration of the project
- A 50-hour construction work week with single (day) shift staffing
- Third-party quality control and testing and construction survey
- Labor for commissioning support
- Cold weather concrete protection
- Temporary construction facilities, including offices, break rooms, and toilet facilities
- Sales taxes for contractor purchased items

These direct general construction costs are presented in Table 6-3 below.

Table 6-3 General Construction Costs

General Construction Costs	Initial Capital (\$ M)
Sitework – Roads and Improvements	14.2
Area 100: Monazite and Dry Caustic Storage	8.9
Area 200: Crack and Leach	20.4
Area 300: Solvent Extraction and Separation	21.2
Area 400: Product Finishing including NdPr	13.9
Area 500: Product Storage	2.9
Area 600: Reagents Receiving and Storage	3.1
Area 700: Utilities	1.7
Substation Site and Foundations	0.2
Mechanical Piping	17.1
Set Owner Provided Equipment	20.5
Pipe Rack Installation	8.2
Total General Construction Costs	132.3

Note. \$ M = millions of U.S. dollars

6.1.1.3 Electrical Construction Costs

Progressive Industrial Electrical, Inc. (PIE) based in Murray, Utah, prepared the electrical construction cost estimate which includes all supervision, labor, construction equipment, and required materials as specified to complete the electrical construction portion of this project. This estimate was developed on the basis of the following:

- Major electrical equipment costs were obtained from budgetary quotes
- Wire, cable, and cable tray pricing were derived from current pricing for these items
- Labor hours and rates were calculated in accordance with industry standards
- Small electrical items were derived from a combination of budgetary quotes and current pricing

These direct electrical construction costs are presented in Table 6-4 below.

Table 6-4 Electrical Construction Costs

Electrical Construction Costs	Initial Capital (\$ M)
Administration Building	0.4
Area 100: Monazite and Dry Caustic Storage	0.9
Area 200: Crack and Leach	7.1
Area 300: Solvent Extraction and Separation	20.7
Area 400: Product Finishing including NdPr	12.7
Area 500: Product Storage	0.3
Area 600: Reagents Receiving and Storage	5.2
Area 700: Utilities	2.6
Temporary Power for Construction	0.8
Substation	5.2
Miscellaneous Electrical	3.4
Potable Water	0.1
Total Electrical Construction Costs	59.2

Note. \$ M = millions of U.S. dollars

6.1.1.4 Administration Building Design and Construction Costs

Case, Lowe, and Hart Architects and Engineers (CLH) based in Odgen, Utah, prepared the administration building cost estimate which includes all supervision, labor, construction equipment, and required materials as specified to complete the administration building construction portion of this project. This estimate was developed on the basis of the following:

- Two-story, 35,110-square-foot (3,262-square-meter) building
- Includes all civil, structural, mechanical, and electrical construction based on floor plans and renderings developed for the BFS
- Includes design and engineering by an architectural-engineering firm
- Construction estimate assumes a standalone project under a separate GC and is based on current pricing for similar facilities

These direct administration building costs are presented in Table 6-5 below.

Table 6-5 Administration Building Design and Construction Costs

Administration Building Costs	Initial Capital (\$ M)
Administration Building	12.0
General Contractor Overhead and Profit	2.0
Design and Engineering for Administration Building	0.8
Total Administration Building Costs	14.8

Note. \$ M = millions of U.S. dollars

6.1.2 Indirect Costs

Indirect capital costs apply across the project and include items like procurement services, owner construction management, detailed engineering, freight, pre-commissioning, commissioning, performance testing, training, first fill reagents, and first fill oils and lubricants. The estimated indirect costs for the project are presented in Table 6-6 below. Most of these values were estimated as a percentage of a cost basis (such as direct total cost or equipment cost). First fills for reagents were calculated based on tank volumes from the major equipment list.

Table 6-6 Indirect Costs

Indirect Project Costs	Initial Capital (\$ M)	Basis	% of Basis
Procurement Services	0.7	Direct Cost Total (2 FTE staff for 20 months, including expenses)	0.25%
Detailed Engineering and Design	18.0	Direct Cost Total	6.25%
Freight and Logistics	3.3	Equipment Cost Total	4.0%
Construction Management	4.7	Direct Cost Total (8 FTE staff for 20 months, including expenses)	1.5%
Pre-Commissioning Including Vendor Support	3.2	Direct Cost Total	1.1%
Commissioning and Testing Including Vendor Support	3.2	Direct Cost Total	1.1%
Performance Testing	2.9	Direct Cost Total	1.0%
Training	1.5	Direct Cost Total	0.5%
First Fill – Reagents	10.8	Calculated from Equipment List and Tank Volumes	-
First Fill – Oil/Lubricants	0.4	Equipment Cost Total	0.5%
Total Indirect Costs	48.7		

Note. \$ M = millions of U.S. dollars, FTE – full time equivalent

6.1.3 Owner's Costs

Owner's costs include owner's project management and cost of initial spares on hand for startup, both of which are estimated as a percentage of total direct cost or total estimated cost. We have also included a line-item estimated cost for engineering, procurement, and construction of the two new evaporation cells as provided by EF. The estimated owner's costs for the project are presented in Table 6-7 below.

Table 6-7 Owner's Costs

Owner's Costs	Initial Capital (\$ M)	Basis	% of Basis
Owner Project Management	1.2	Total Direct Cost	0.4%
Initial Spares	4.1	Total Equipment Cost	5%
New Evaporation Cells	30	EF Estimate	n/a
Total Owners Costs	35.3		

Note. \$ M = millions of U.S. dollars

6.1.4 Sustaining Capital

In collaboration with EF White Mesa Mill operations management, an approach for sustaining capital application was agreed upon, which assumes a steady ramp up from \$5 M in the first full year of operation to \$25 M per year in the fifth full year of operation. A similar assumption was used at the end of the life of the operation starting six years from closure and ramping down to no capital spending in the last full year of production. The sustaining capital expenditure approach adopted for financial modeling is presented in Table 6-8 below:

Table 6-8 Annual Sustaining Capital Expenditures

Timeframe	Sustaining Capital Expenditures (\$ M)
First Full Year of Production	5.0
Second Full Year of Production	10.0
Third Full Year of Production	15.0
Fourth Full Year of Production	20.0
Fifth Full Year of Production	25.0
Production Years 6 Through 45	25.0 per annum
Year 46	20.0
Year 47	15.0
Year 48	10.0
Year 49	5.0
Year 50	0

Note. \$ M = millions of U.S. dollars

6.1.5 Contingency

Contingency has been applied in a manner consistent with the AACE guidelines for Class 3 estimates and S-K 1300 requirements regarding application of contingency for feasibility studies.

The project has been developed to the point of having a robust process flow diagram and mass and energy balance, coupled with a largely complete major equipment list with associated capital costs. As noted above, the capital costs for major equipment are derived from direct quotes for nearly 90% of equipment (price weighted), and the quoted equipment has been appropriately sized for this flowsheet. Preliminary P&IDs have been developed for most of the process, leading to defensible instrument and valve lists. For these reasons, an applied contingency of 10% is appropriate for this study.

6.1.6 Assumptions and Exclusions

The estimate has been based on the following assumptions and exclusions and is therefore qualified by them.

6.1.6.1 Assumptions

1. The estimate is expressed in U.S. dollars and includes no provision for exchange rate fluctuations that might impact costs
2. The estimate is deemed to reflect prices and market conditions as of November 2025, with no provision for forward escalation beyond this date
3. Estimates based on EF experience and guidance include:
 - a. Operating costs including all labor, utilities, consumables, sustaining capital, general, and administration
 - b. Water supply well construction costs and approximate distances from the site for estimating pipeline construction costs
 - c. Previous SX fire suppression engineering evaluations commissioned by EF
 - d. Potable water treatment system construction and installation costs
 - e. Engineering, procurement, and construction costs for two new evaporation cells
4. Sufficient labor will be available to perform the work for the costs assumed in the estimate
5. Sufficient space is available for laydown areas adjacent to contractor work fronts
6. Engineering design and subsequent procurement of materials will be conducted in a timely manner beginning in the first quarter of 2026
7. The project will seek to maximize pre-assembly and modularization of the facilities to reduce onsite labor requirements and costs
8. No constructability reviews have been undertaken during the preparation of this estimate
9. No lifting or logistics studies have been undertaken during the preparation of this estimate

7 Economic Analysis

The economic assessment for the project is summarized below.

7.1 Assumptions, Parameters, and Methods

The economic evaluation is based on the sale of the recovered RE and U_3O_8 products from monazite ore (sand) received at the White Mesa Mill (WMM) from heavy mineral sand operations. The operating and capital costs estimates for Project Alkali were developed for the processing facility with the following included in the consideration:

- Sourcing cost associated with the supply of monazite ore from multiple sources
- Cost of shipping the monazite ore feed from various sources to the WMM

The economic analysis is based on the following assumptions:

- Discount rate of 8%
- 40 years of production
- Cost escalation of 2.5% annually
- Product price forecast with 2.5% annual escalation
- Annual monazite feed to the WMM of 50,000 t
- 1% royalty for San Juan County Clean Energy Foundation (net revenue basis less monazite supply costs)
- Results are based on 100% EF ownership

Table 7-1 outlines the product prices used in the economic analysis. Price assumptions for a mixture of heavy rare earth (RE) elements—commonly holmium (Ho), europium (Eu), lutetium (Lu), ytterbium (Yb), and yttrium (Y)—as carbonate, and mixed samarium (Sm), europium (Eu), and gadolinium (Gd), collectively referred to as SEG, as carbonate, are based on 70% payability of the contained REO equivalent.

Table 7-1 Project RE Product Pricing (includes 2.5% escalation)

Product	Unit	2026	2027	2028	2029	2030	2040	2050	2060	2068
NdPr Oxide	\$/kg	75	85	90	94	97	167	214	274	334
Dy Oxide	\$/kg	251	289	323	359	373	572	732	937	1,142
Tb Oxide	\$/kg	1,051	1,156	1,287	1,352	1,443	2,230	2,855	3,655	4,453
Ho+ Carbonate	\$/kg	0	0	0	11	12	15	20	25	31
SEG Carbonate	\$/kg	0	0	0	12	13	22	29	37	48
U_3O_8	\$/lb	96	97	106	112	117	180	230	295	359

Source: TradeTech LLC (2025)

Note. kg = kilogram, lb = pound, \$ = USD

The project has been evaluated on an after-tax basis to provide a more indicative (but still approximate) value for potential project economics. The tax model contains the following assumptions:

- Federal Income Tax: 21%
- Utah State Income Tax: 4.5%
- San Juan County Taxes: \$550,000 annually in 2025 and a \$1,000,000 estimate beginning in 2030 with 2.5% annual escalation after 2030

Total taxes for the project amount to \$4,019 M over the project life.

7.2 Economic Analysis and Annual Cash Flow Forecast

The project is economically viable with an after-tax IRR of 33% and an after-tax NPV of \$1,918 M using an 8% discount rate (NPV 8%) and a payback period of 6.4 years.

The financial results indicate a pre-tax NPV of \$2,601 M at a discount rate of 8%, an IRR of 37%, and a payback period of 6.2 years. Table 7-2 summarizes the financial results of the project. The total revenue for the project was estimated at \$61,099 M, and the total operating costs were estimated at \$43,266 M. The total initial capital costs were evaluated at \$437 M (escalated 2025 basis of \$410 M total), the total sustaining capital requirement was evaluated at \$1,564 M, and the closure cost was evaluated at \$29 M. Figure 7-1 illustrates the project's pre-tax and after-tax cash flow and cumulative cash flow profile.

Table 7-2 Financial Results of the Project

Economic Highlights	Unit	Value
Total Revenue	\$ M	61,099
Total Operating Costs	\$ M	43,266
Initial Capital Costs	\$ M	437
Sustaining Capital Costs	\$ M	1,564
Closure/Reclamation Costs	\$ M	29
Total Pre-Tax Cash Flow	\$ M	15,802
Pre-Tax NPV at 5%	\$ M	4,701
Pre-Tax NPV at 8%	\$ M	2,601
Pre-Tax NPV at 10%	\$ M	1,830
Pre-Tax IRR	%	37%
Pre-Tax Payback Period	years	6.23
After-Tax Cash Flow	\$ M	11,783
After-Tax NPV at 5%	\$ M	3,490
After-Tax NPV at 8%	\$ M	1,918
After-Tax NPV at 10%	\$ M	1,340
After-Tax IRR	%	33%
After-Tax Payback Period	years	6.36

Note. IRR = internal rate of return, NPV = net present value, \$ M = millions of U.S. dollars

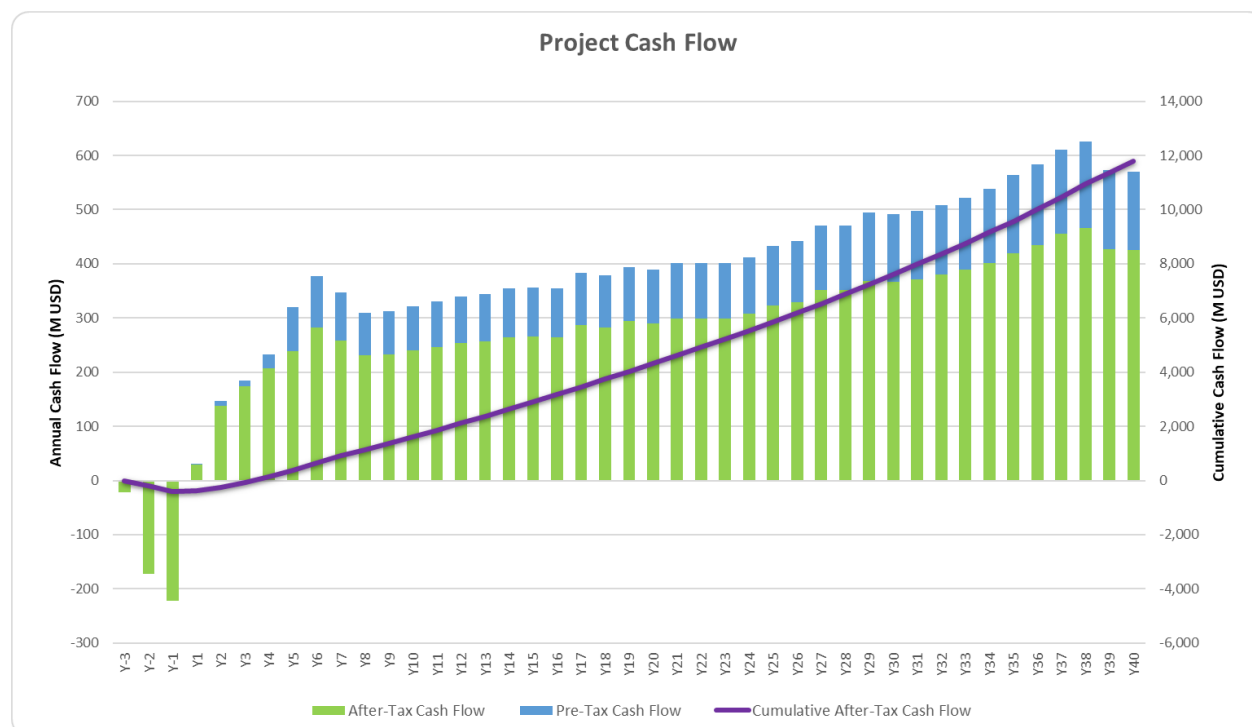


Figure 7-1 Pre-Tax and After-Tax Cash Flow and Cumulative Cash Flow Profile of the Project

7.3 Sensitivity Analysis

A univariate sensitivity analysis was performed to examine which factors most affect the project economics when acting independently of all other cost and revenue factors. Each variable evaluated was tested using the same percentage range of variation, from -30% to +30%, although some variables may experience significantly larger or smaller percentage fluctuations over the life of the project. For instance, the product prices were evaluated at a $\pm 30\%$ range compared to the base case, while the capital costs and all other variables remained constant. This may not truly represent market scenarios, as commodity prices may not fluctuate in a similar trend. The variables examined in this analysis are those commonly considered in similar studies—their selection for examination does not reflect any particular uncertainty.

The analysis revealed that the project NPV and IRR are most sensitive to product prices and annual production, with moderate sensitivity to the accuracy of the operating cost estimate and limited sensitivity to the capital cost estimate, as shown in Figure 7-2 through Figure 7-5. The sensitivity trend lines for pre-tax and post-tax show minimal changes.

Both NPV and IRR remain positive at the upper limits (+30%) of capital and operating costs, which suggests that the project can absorb much higher costs. At the lower limit of the product prices and the production rate (-30%), the NPV becomes negative, and the IRR is lower than the discount rate. This demonstrates that the project is sensitive to unfavorable market conditions. On the other hand, favorable market conditions would significantly increase (and potentially double) the project's NPV.

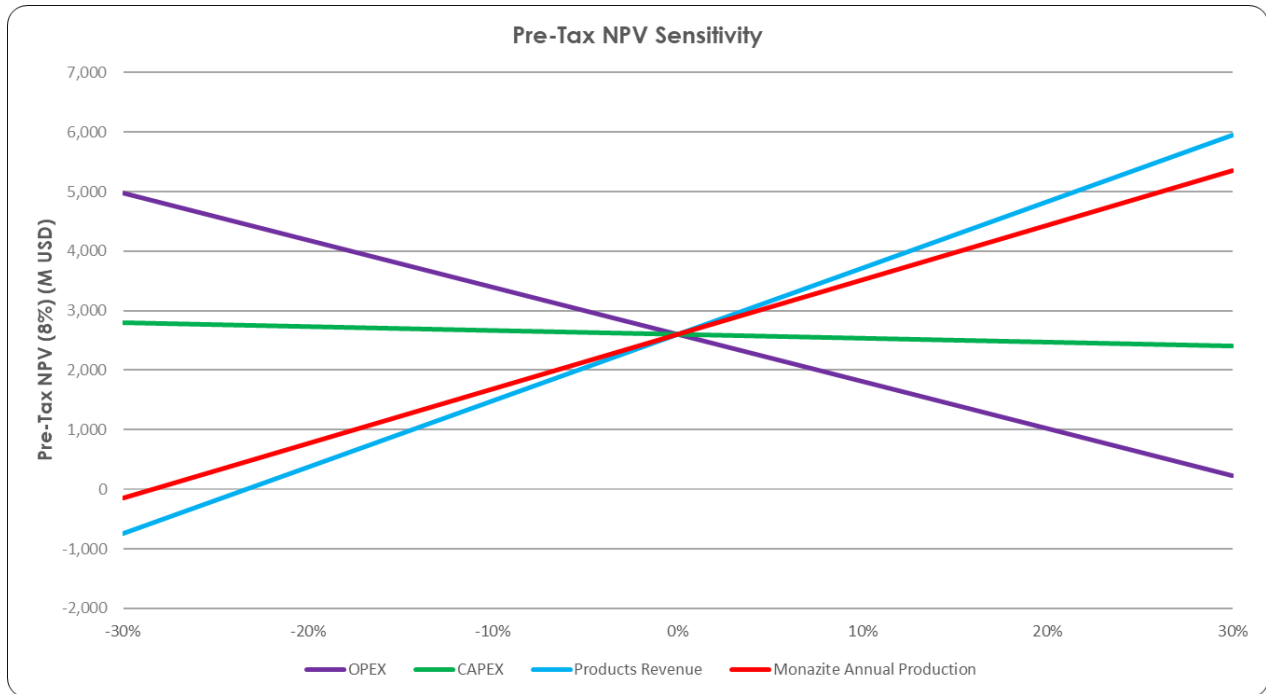


Figure 7-2 Pre-Tax NPV Sensitivity (8%)

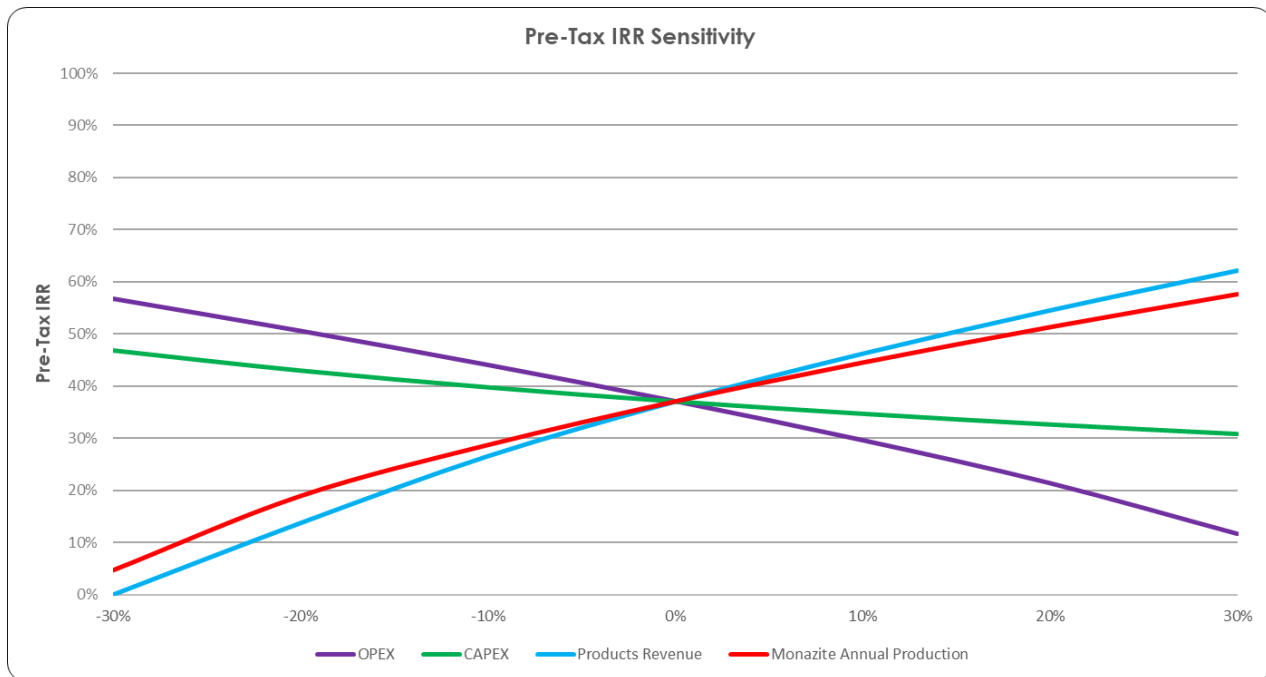


Figure 7-3 Pre-Tax IRR Sensitivity

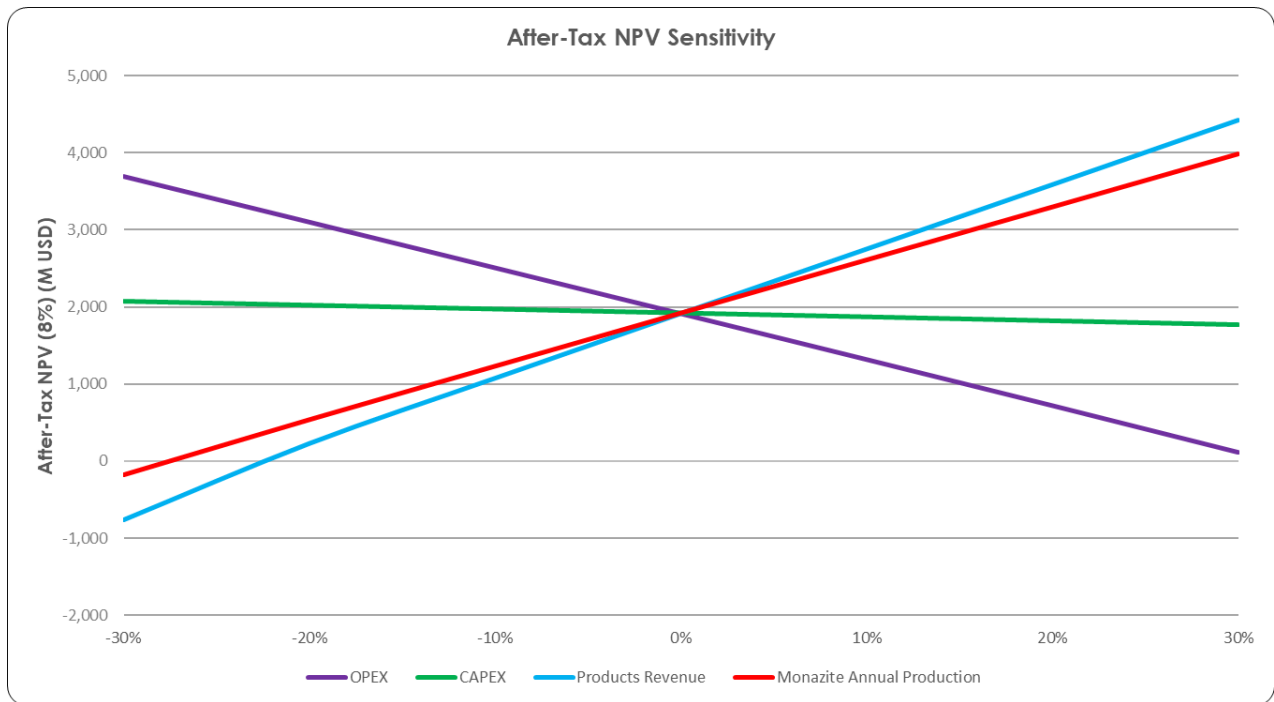


Figure 7-4 After-Tax NPV Sensitivity

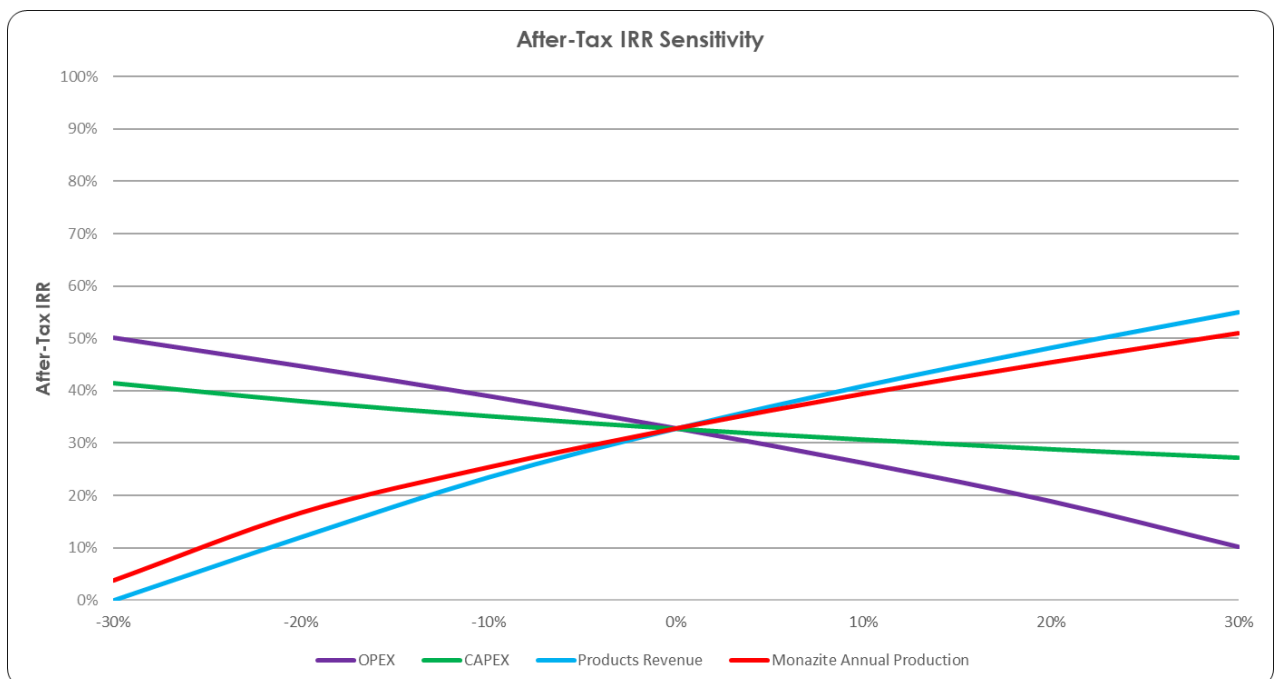


Figure 7-5 After-Tax IRR Sensitivity

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