Exhibit 96.1

S-K 1300 Report

Technical Report Summary on the Darling Range, Western Australia

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Table of Contents

Tables in Text

Figures in Text

1.0 Executive Summary

1.1 Summary

SLR International Corporation (SLR or the QP) was appointed by Alcoa Corporation (Alcoa) to prepare an independent Technical Report Summary (TRS) on the Darling Range bauxite mines, located in Western Australia. The purpose of this report is to support the Mineral Resource and Mineral Reserve estimates for the mines as of December 31, 2024. This TRS conforms to the United States Securities and Exchange Commission's (SEC) Modernized Property Disclosure Requirements for Mining Registrants as described in Subpart 1300 of Regulation S-K, Disclosure by Registrants Engaged in Mining Operations (S-K 1300), and Item 601(b)(96) of Regulation S-K, Technical Report Summary.

1.1.1 Conclusions

1.1.1.1 Geology and Mineral Resources

- SLR is independently declaring the 31 December 2024 Mineral Resources for the defined bauxites located within Alcoa's Darling Range deposits. The Mineral Resource models were prepared by Alcoa using their in-house estimation procedures and reviewed extensively by SLR.
- As of December 31, 2024, exclusive of Mineral Reserves, as summarized in Table 11-13 at an appropriate level of precision reflecting confidence, the Measured Mineral Resources are estimated to be 139.6 Mt at a grade of 30.4% available alumina (AL) and 1.77% reactive silica (SI). Similarly, the Indicated Mineral Resources are estimated to be 48.7 Mt at 30.3% AL and 1.42% SI, and the Inferred Mineral Resources are estimated to be 101.4 Mt at 32.4% AL and 1.20% SI.
- Drill sampling and sample control procedures at Alcoa's Darling Range Bauxite Operations are adequate and appropriate for use in the estimation of Mineral Resources. The defined volumes and grades of mineralization are not expected to be systematically impacted (biased) by errors in either the collar location or the 3D sample location.
- The Quality Assurance / Quality Control (QA/QC) of sample preparation and assaying is adequate, and the assay results are suitable for use in Mineral Resource estimation
- Analytical procedures used for the Alcoa Mineral Resource comprises part of conventional industry practice. FTIR is not widely used yet in the bauxite industry but is becoming more widely accepted and applied to more operations. At Alcoa the method has been consistently applied successfully for a decade and is routinely validated by industry standard XRF and wet chemical procedures as discussed in Sections 8.3 and 8.4. It is the opinion of the QP from the studies on FTIR repeatability discussed above that the overall precision and accuracy of the FTIR assaying is acceptable.
- The database is adequate, and the data is appropriate for the purpose of Mineral Resource estimation.
- The continuous improvements in the geological modelling, estimation techniques, and block model migration to the 3D approach are appropriate and constantly improve the confidence level and precision of the Mineral Resources.
- The dry bulk density data is less well controlled than other analytes, although different attempts were taken since 1980. However, based on the different

reconciliation approaches and on the fact that the polygonal and GSM model have lower confidence level, the density values are acceptable for the Resource estimation.

- The condition of Reasonable Prospects for Economic Extraction is met by constraining the Mineral Resource model using the ArcGIS system, by ensuring that the model defines key parameters for the refinery, and by sound reconciliation practices providing feedback that the modelling is appropriate for the purpose.

1.1.1.2 Mining and Mineral Reserves

- As of December 31, 2024, Proven Mineral Reserves are estimated to total 26.1 Mt at 29.2% AL and 1.61% SI and Probable Mineral Reserves are estimated to total 397.6 Mt at 30.8% AL and 1.56% SI.
- The QP has used the December 31, 2024 Mineral Resource estimate as the basis for its Mineral Reserve estimate, applying Modifying Factors only to those Resources classified as Measured Mineral Resources and Indicated Mineral Resources.
- The bauxite operations are operating mining projects with a long history of production for which establishment capital has been repaid and for which sustaining capital and supported operating costs have been observed to be applied in economic analysis. The review of the Capex Front End Loading (FEL) 2 Study report for the Myara North Crusher move has provided further support. Consequently, the QP considers that support by a Feasibility Study (FS) is demonstrated by the history of profitable operation and the level of technical support for the Modifying Factors. The QP has reviewed the operating and planning procedures and parameters for the operations.
- The QP considers that the accuracy and confidence in the Mineral Reserve estimate to be appropriate for the classification applied, which is supported by both the conservative operational processes and the long operational history.
- The QP is not aware of any risk factors associated with, or changes to, any aspects of the Modifying Factors such as mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the current Mineral Reserve estimate. The Darling Range operations have however undergone some changes as related to the permitting requirements which are discussed in this report; namely the approvals process, river corridor constraints, restoration obligations, and any required adjustments to accommodate the Q2 2024 curtailment of the Kwinana refinery.

1.1.1.3 Mineral Processing

- The operating data between 2010 and 2024 indicates that the product from the Darling Range operations consisted of an average AL grade of 33%, with SI below the target for refinery feed.
- The QP is of the opinion that the Darling Range operation demonstrated that ore can be effectively crushed and supplied to a refinery for further upgrading to produce alumina. The historical operational data confirmed that the ore consistently met refinery specifications without any deleterious elements.
    - Based on this, and additional information provided by Alcoa regarding the mine plan, it is reasonable to assume that the ore from Darling Range will meet the refinery specifications for the next nine years.

1.1.1.4 Infrastructure

- The Darling Range mining operations have established and operational infrastructure, with mining hubs that host administrative offices, as well as crushing facilities and maintenance facilities.
  - Hubs are relocated periodically as production moves away from the hub and transportation costs increase. These relocations are well-understood with planning and associated budgeting occurring well in advance of relocations; production restarted seven days after the most recent shutdown.
- An extensive haul road network, rail, and overland conveyors transport crushed bauxite from the Hub to the refineries.
  - Bauxite is transferred from each mine to the refineries primarily via long distance conveyor belt.
  - Alumina produced by the Pinjarra and Wagerup refineries is then shipped to external and internal smelter customers through the Kwinana and Bunbury ports.
  - As intended the Kwinana refinery ceased production in the second quarter of 2024 following phased curtailment. The updated mine plans have been revised accordingly.
- The Huntly and Willowdale mines are located near the towns of Pinjarra and Waroona respectively. These are easily accessible via the national South Western Highway, a sealed single carriageway road, spanning almost 400 km from the southern side of Perth to the southwest corner of Western Australia.
- Sealed access roads to the main hubs have been established, connecting Huntly and Willowdale to the road network.
- Major haul roads have been established to each mining area, while secondary haul roads cross-cut each individual mining plateau. Roads are unsealed and require continuous maintenance.
- The Darling Range's Pinjarra refinery receives power from the South West Interconnected System (SWIS), but also has internal generation capacity of 100 MW from four steam driven turbine alternators, with steam produced by gas fired boilers and a gas turbine Heat Recovery Steam Generator (HRSG).
  - The refinery supplies power to the Huntly Mine by a 33,000 volt power supply line and two 13,800 volt lines.
- The Wagerup refinery is a net exporter of power to the SWIS, with internal generation capacity of 108 MW from three steam driven turbine alternators and one gas turbine; steam being generated by gas fired boilers.
  - The refinery supplies power to the Willowdale Mine by a single 22,000 volt power supply.
- Water is used on the mines for dust suppression, dieback washdown, vehicle washdown, workshops, conveyor belt wash, construction, and domestic purposes.
  - The water supplies for mining consist of licensed surface water sources supplemented with treated wastewater from vehicle washdowns, stormwater runoff and maintenance workshops.
  - The annual volume of freshwater abstracted under the Department of Water and Environmental Regulation (DWER) surface water licences and Water Corporation supply agreements decreased from Boronia Dam in comparison to 2022, and remained reasonably consistent to 2022 from Banksiadale and Samson Dams.

- In 2023, water abstraction comprised approximately:
  - 4.2% of the annual entitlement from Boronia Dam (i.e. 2,931.1 kL), in comparison to 53% in 2022.
  - 22% from Banksiadale Dam (i.e. 108,412 kL), in comparison to 22% in 2022.
  - 82% from Samson Dam (i.e. 368,017), in comparison to 70% in 2022.
- An additional 126,306 kL was also abstracted from South Dandalup Dam under the agreement with Water Corporation, significantly reduced from 2022 (651,840.7 kL).

- On site facilities include offices, ablutions, crib-rooms, and workshops, however there are no Alcoa accommodation facilities, as the Huntly and Willowdale mining areas are close to established population centers.
- No tailings are generated within the boundaries of the mining operations and waste dumps are not constructed. The management of tailings generated downstream at the refineries is beyond the boundaries of the Darling Range mining operations and are therefore not considered in this TRS.
- Overburden is segregated for later contouring and rehabilitation of adjacent, completed mining operations. Caprock and other non-viable rock is used to backfill these shallow, completed pits and the viable topsoil is spread on top, contoured, and revegetated.

1.1.1.5 Environment

- Alcoa has established processes to facilitate conformance with environmental requirements, identifying sensitive areas ahead of time enables them to be managed ahead of disturbance.
- Mining in some areas became more constrained in 2023 as a result of internal and external factors. This has continued into 2024 and has resulted in a presumed temporary decrease in operability and associated decrease in Reserve estimation.
- The 2023-2027 MMP describes Alcoa's proposed mining operations for the Huntly and Willowdale mines within ML1SA from 1 January 2023 to 31 December 2027. It excludes an environmental assessment of mine development activities associated with Myara North or Holyoake mining regions currently under consideration by the EPA and the Department of Climate Change, Energy, the Environment and Water (DCCEEW).
- Alcoa has made progress in drafting and implementing a number of new management plans and processes required to meet current compliance requirements.
- Alcoa is modernizing its environmental approvals framework for its Huntly Bauxite Mine and Pinjarra Alumina Refinery, by referring future mining plans for assessment under Part IV of the Western Australian *Environmental Protection Act 1986* (EP) and the Australian *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Construction for Myara North will be commenced pursuant to the requirements of the Ministerial Decision, which will be issued upon completion of the EPA assessment process indicatively forecast for the first quarter of 2026, as opposed to approximately mid-2025 as reported in the TRS for 2023. The timeframe to approval of Myara North and Holyoake under the EP and EPBC Act can be estimated, but not predicted with certainty; further delays are possible.

- Importantly, on 14 December 2023 the State Government announced the *Alcoa Transitional Approvals Framework* which will enable Alcoa to continue mining as defined in the 2023-2027 MMP while the formal EPA EIA is in progress. In most circumstances, activities under assessment must cease during the EPA's process. Note, that the State Government reserves the right to, with reasonable notice, withdraw or amend the exemption at any point. In October 2024 the Premier rolled over the 2023-2027 approval to cover 2024-2028 with the same conditions.
- Alcoa's mine sites are monitored in accordance with the conditions of Government authorizations and its operational licenses at Huntly (L6210/1991/10) and Willowdale (L6465/1989/10) and the MMP. Compliance with the section 6 exemption order is also required from 14 December 2023. Outcomes of and compliance with the management and monitoring programs are tracked within Alcoa's Environmental Management System and reported within the Annual Environmental Review report:
  - Review of the most recent report, JTSI Annual Environmental Review 2023 (dated April 2024), largely reported compliance with environmental commitments and success of operational controls to manage environmental objectives.
  - In addition, outcomes of and compliance with the management and monitoring programs are reported within the 2023 Annual Environmental Review against the current MMP to JTSI, and in monthly reports demonstrating compliance with the Exemption Order.
- Alcoa implements a comprehensive water management and monitoring program in accordance with the requirements of its abstraction and operational licenses.
- A groundwater monitoring program commenced in the second half of 2022 across the Darling Range operations to support approvals and operational monitoring, this is ongoing.
- Alcoa has established systems and processes to support maintenance of its social license to operate and conducts an extensive program of community relations activities to ensure that the public is aware and informed regarding its operations.
- Alcoa's Social Performance Management System (SPMS), SP360, is in place across its global operations. The SPMS supports locations to undertake effective engagement with communities, manage their social risks and maintain Alcoa's Social License to Operate.
- Alcoa's Closure Planning group for Darling Range (located within the Global Planning Team) is responsible for developing the closure planning process as well as the subsequent Long-Term Mine Closure Plans (LTMCPs) of Alcoa's WA Mining Operations (Huntly and Willowdale).
- The current 2023-2027 MMP aims to establish, and return to the State, a self-sustaining Jarrah Forest ecosystem, that meets the agreed forest values that will support similar management practices as that employed in the surrounding Northern Jarrah Forest.

1.1.2 Recommendations

1.1.2.1 Geology and Mineral Resources

It is apparent to the QP that the long history of exploration, development and mining of Alcoa's Darling Range bauxite tenements have established sound knowledge and understanding of the geology and mineral endowment. The QP has not identified any fatal flaws in the current practices of mapping (based on the ArcGIS system), drill sampling (based on progressive continuous improvement), assaying (based on calibrated and

validated FTIR, with reasonable quality control), estimation (3D Block Model - 3DBM), database management (using acQuire), the application of mining criteria that assure RPEE, and the application of constraints establishing forestry, heritage and noise limits to the Mineral Resource definition. The following recommendations are offered as suggestions for further improvement, aligned with Alcoa's comprehensive approach to research and development (seen for example in the evolution of their drilling, sampling and assaying technologies). These recommendations are prioritized in terms of their perceived value to the overall operation, but are not expected to add cost:

- Continuing to replace the gridded seam model (GSM) and polygonal areas to the 3D block modelling methodology, using a script-based semi-automated approach, which enables more robust rapid model building. The validation of interpolation parameters using risk-based (conditional simulation) techniques to quantify confidence should be considered.
- To improve the reporting of recoverable resources, a re-blocked block model to a minimum practical mining scale or single mining unit (SMU) should be considered. Economical parameters considering more flexible costs and bauxite prices related to the Mineral Reserves can also be implemented in the Mineral Resources workflow, aiming to optimize the bauxite mineable portion including potential marginal grades.
- Investigate whether the 5% bias in the tonnage between the As Mined and sampling tower weightometers is persistent in the 3D block models.
- Further redrilling or where viable re-assaying of pulps.
- Continue implementing the reconciliation system to understand and adjust differences in density and reactive silica, as well as to track the monthly performance of geological models with the refinery.
- To include volume surveys using drones and truck gantry scanning, wet mass measurement using weightometers on conveyors and LoadRite sensors on mining equipment, and infra-red moisture determination, meaning that better in situ dry density estimation may become possible if the operation requires it for better refinery feedstock control.
- The QP considers that twinned hole studies are of limited value and should only be implemented once the sample splitting and preparation demonstrates good repeatability, using field duplicates (or the equivalent sample to extinction (STE) samples). They may be of value to investigate specific issues under closely supervised conditions.
- While the STE procedure could be retained for specific studies, in the QP's opinion, the reintroduction of field duplicates using appropriate riffle splitters under supervision should be considered.
- The QP is of the opinion that the grade characteristics of the bauxite profile could be reproduced in the model, which enables optimization techniques to be used for the definition of mining floors and boundaries, better support for ore loss and dilution studies, and more accurate reconciliation studies.

1.1.2.2 Mining and Mineral Reserves

- Currently a historical dilution and mining recovery factor is applied to the final Reserves to reconcile the tonnes and grade. The QP recommends applying dilution and ore loss at the re-blocked model level before performing the optimization and reporting these values independently.

- A reconciliation system should be implemented to allow the comparison of mined tonnes to the predicted tonnes of the geological model. This system would assist in defining dilution and losses related to modifying factors. Alcoa has been actively developing this reconciliation system during 2024 with an intention to implementation for 2025.
- As recommended from 2023, a mine planning schedule (LTMP) has been developed providing a strategic schedule over nine years which incorporates a tactical schedule over the first 3 years. However, currently Reserves would provide an additional 3 years of mine scheduling which would benefit cashflow modelling. Completing a strategic mine schedule for the total Reserve would allow impacts from sequencing of later Capital costs to be modelled appropriately. The view of the QP is that the unscheduled Reserve ore tonnes should be added to the LTMP.
- The QP recommends that a defined Process Acceptance Criteria is provided with specifications on upper and lower limits for all key process constraints.
- The QP recommends detailed haulage analysis is provided focusing on haulage profiles and cycle times, this process will provide more accurate forecasting of operating costs. It is noted during the 2024 visit that Alcoa are currently developing workflows for simulation software.
- Capital costs for the Myara North and Holyoake mine moves were in the process of being developed to FEL 3 classification. These costs should be reviewed during the next update.

1.1.2.3 Mineral Processing

The historical operational data for the Darling Range demonstrates that ore consistently met refinery specifications.

- Ideally, independent verification of sample analysis is conducted, by a certified laboratory, on a structured program, to ensure the QA/QC aspects of the internal analysis. Within this process a proportion of samples from each batch could be sent to the independent laboratory for analysis and the results can be compared with the internal analysis.
- The QP is appreciative that the mine is operational, meaning a trade-off versus logistics / practicality would need to be carried out.

1.1.2.4 Infrastructure

The Darling Range mining operations have well established infrastructure, with mining hubs that are periodically moved to reduce transportation distances between mining operations and the hubs. The QP makes no recommendations regarding infrastructure.

1.1.2.5 Environment

Alcoa has established systems to facilitate adherence to environmental commitments and has made progress with modernizing environmental approvals and permits for Huntly, Willowdale and the future mining areas at Holyoake and Myara North. The QP recommends that the following action is taken:

- Continued close engagement with EPA, DCCEEW and the Bauxite Strategic Executive Committee (BSEC) (previously the Mining and Management Program Liaison Group (MMPLG)) to best enable a prompt resolution to approval and permitting process to minimize impacts to the Reserve estimate into the future.

- Continued compliance with all approval and permit requirements. Compliance with the conditions associated with the *Alcoa Transitional Approvals Framework* exemption is critical as the State Government reserves the right to, with reasonable notice, withdraw or amend the exemption at any point.
- Alcoa began installing groundwater monitoring bores in 2022 to facilitate assessment of groundwater levels and water quality in proposed mining areas. The boreholes are installed prior to mining to understand the baseline site conditions and interim groundwater levels and inform pit design and to understand the recharge from precipitation in the long term and to assess the groundwater response before, after and during mining operations. Preliminary results and how those results have informed changes to pit design should be reported in the next TRS.
- Close-out the Auditor-compliant contaminated sites process related to the identification of low levels of PFAS and AFFF on site.

1.2 Economic Analysis

1.2.1 Economic Criteria

A technical-economic model was prepared on an after-tax discounted cash flow (DCF) basis, the results of which are presented in this subsection.

Annual estimates of mine production with associated cash flows are provided for years 2025 to 2033 inclusive, based on Proven and Probable Reserves only.

Key criteria used in the analysis are discussed elsewhere throughout this TRS. General assumptions used are summarized in Table 1-1. All values are presented in United States Dollars ($) unless otherwise stated.

Table 1-1: LOM Technical-Economic Assumptions

Description	Value
Start Date	January 1, 2025
Mine Life based on Mineral Reserves	9 years
Average LOM Price Assumption	$23.19
Total Operating Costs	$4,045.2 million
Capital over nine years	$1,174.6 million
Income tax	$226.0 million
Discount Rate	9.5%
Discounting Basis	End of Period
Corporate Income Tax Rate	30%
Model Basis	Nominal

1.2.2 Cash Flow Analysis

The economic analysis presented herein complies with S-K 1300 requirements and is based on a reserve-based discounted cashflow analysis using only Proven and Probable Mineral Reserves for the 9-year mine planning window.

Using the defined 9-year detailed mine plan period, at a 9.5% discount rate and average bauxite price of $23.19/t, the operation generates an after-tax NPV of $54.7 million.

This figure reflects substantial sustaining capital requirements (major mine moves, conveyor replacements, haul roads, and other sustaining operations) during the period. This valuation is presented on a 100% attributable basis using nominal cash flows which allow for annual price inflation of 3% and cost escalation primarily ranging between 2 and 3%.

Table 1-2: LOM Indicative Economic Results

Description	Units	Total LOM
LOM	Years	9
LOM Bauxite Production (wet)	Mt	298.5
Average LOM Price	$/t	23.19
Gross Revenue	$ million	**6,920.5**
Labor	$ million	1,233.1
Services	$ million	345.4
Other Indirect	$ million	899.2
PAE – Corporate Chargebacks	$ million	239.5
Energy	$ million	28.4
Fuel	$ million	230.2
Supplies	$ million	275.6
Maintenance	$ million	569.6
On-site Mine Operating Costs	$ million	**3,821.0**
Off-site Mine Operating Costs	$ million	**224.2**
Corporate Income Tax	$ million	333.7
Net Income after Taxes	$ million	**778.7**
Depreciation Tax Savings	$ million	1,763.0
Sustaining Capital (2025 to 2033 inclusive)	$ million	1,174.6
Closure Costs	$ million	Included in ARO under operating costs
Free Cash Flow	$ million	**342.3**
NPV @ 9.5%	$ million	**54.7**

1.2.3 Sensitivity Analysis

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities. The operation is nominally most sensitive to market prices (revenues) followed by operating costs.

1.3 Technical Summary

1.3.1 Property Description

The Mineral Resource and Reserve estimates declared in this Report were derived for bauxite deposits located within the Darling Range in the southwest of Western Australia. The mining center of Huntly is located approximately 80 km to the southeast of Perth, and approximately 30 km northeast of the township of Pinjarra. Willowdale is located 100 km south-southeast of Perth, and approximately 20 km southeast of the township of Waroona.

The Pinjarra refinery is located adjacent to the east of the town of Pinjarra and is approximately 25 km southwest of the Huntly mining areas. The Wagerup refinery, supplied by Willowdale, is located immediately adjacent to the east of the South Western Highway, approximately 8 km south of Waroona and 20 km west of the Willowdale mining area. The Kwinana refinery, previously supplied by Huntly, was curtailed in 2024, and lies approximately 50 km northwest of Huntly in the city of Kwinana, a suburb approximately 40 km south of Perth.

1.3.2 Land Tenure

The bauxite deposits are all located within ML1SA. The Agreement permits the exploration and mining of bauxite within the tenement boundaries. ML1SA was granted on 24 September 1961, for four 21-year periods, and the current lease expires on 24 September 2045, with provision for renewal extending beyond 2045. The current lease covers an area of 7,022.61 km², and extends from just north of Perth, to Collie in the south. The legislation under which Alcoa operates is overseen by the Mining and Management Program Liaison Group, which comprises representatives from several State Government departments. The current concession of ML1SA covers an area of 7,022.61 km², extending from the north of Perth on the eastern side to the town of Collie in the south.

Alcoa has the exclusive right to explore for and mine bauxite on all Crown Land within the ML1SA, however a number of environmental and statutory constraints exist within the area, and Alcoa is not permitted to access bauxite from the areas covered under these constraints. For example, the 2023-2027 MMP requires:

- A reduction in mining activities inside higher risk areas within drinking water catchments.
- Alcoa cannot undertake any new pit clearing in any areas with an average pit slope greater than 16% within any Reservoir Protection Zone (RPZ, 2 km from reservoir top water level).
- An increase in rehabilitation and reduction in open areas.
- A maximum annual clearing footprint of 800 ha.

Mineral Resources have not been defined in the constrained areas.

In August 2001, Alcoa entered a sub-lease arrangement with a consortium referred to as the Worsley Participants. This arrangement permits the Worsley Participants to mine and process bauxites within the sub-lease area. Alcoa has not declared Mineral Resources within the sub-lease area.

1.3.3 Ownership

The mining rights and assets involved with bauxite mining and alumina refining in Australia are 100% owned by Alcoa of Australia Limited (AofA), an affiliate of Alcoa owned by Alcoa World Alumina and Chemicals (AWAC). Prior to Alcoa's acquisition of Alumina Limited, Alcoa Corporation and Alumina Limited owned 60% and 40%, respectively, of AWAC, an unincorporated global joint venture consisting of a number of affiliated entities that own, operate, or have an interest in bauxite mines and alumina refineries, as well as an aluminum smelter, in seven countries. In August 2024 Alcoa completed the acquisition of Alumina Limited, putting the AWAC joint venture under full control and ownership of Alcoa. As a result, Alcoa owns 100% of AofA and, indirectly, 100% of the mining rights and assets involved with bauxite mining and alumina refining in Australia.

1.3.4 History

Bauxite occurrences were first recorded in the Darling Range in 1902. Bauxite was detected as a result of analyzing laterite from Wongan Hills, and subsequently through examination of lateritic road gravels from several localities in the Darling Range. The Geological Survey of Western Australia (Geological Survey) produced studies and publications, driving the bauxite exploration, though most attention was focused on localities in the Darling Range close either to Perth or to railway lines servicing towns such as Toodyay and York. By 1938 bauxite deposits were known to be common throughout the Darling Range over an area of 560 km long by 40 km to 80 km wide. The Geological Survey maintained interest in Darling Range laterite as an economic source of aluminum until the 1950s. However, by the late 1950s exploration had been taken over by mining companies. The earliest non-government exploration for bauxite was carried out in 1918 by the Electrolytic Zinc Co. of Australia Pty Ltd, deeming the deposits to be generally low grade and not of commercial value, though like earlier explorers, did not focus upon the underlying friable units.

No further private exploration took place until 1957 when Western Mining Corporation Ltd (WMC) began to explore for bauxite in the Darling Range. Following a regional reconnaissance, a joint venture company, Western Aluminum NL (WANL), formed by WMC with North Broken Hill Ltd and Broken Hill South Ltd, explored temporary reserves over a large portion of the southwest. These areas were part of a Special Mineral Lease (ML1SA) granted to WANL in 1961.

By 1961, WANL had delineated 37 Mt of bauxite at an average grade of 33% AL. Also in 1961, WANL joined with the Aluminum Company of America Ltd (Alcoa US), allowing additional systematic exploration of lease ML1SA. Commercial mining was finally started in 1963 at Jarrahdale and continued until 1998, supplying bauxite to the Kwinana refinery.

In 1977 WANL became Alcoa. As of December 2024, the Huntly and Willowdale mining operations remain active. Huntly supplies bauxite to the Pinjarra refinery (approximately 17 million tonnes per annum, Mtpa) while Willowdale supplies the Wagerup refinery (approximately 10 Mtpa).

1.3.5 Geological Setting, Mineralization, and Deposit

The Mineral Resource estimates declared in this Technical Report Summary were derived for bauxite deposits located within the Darling Range in the southwest of Western Australia. The Darling Range comprises a low incised plateau formed by uplift along the north-south trending Darling Fault, which is a major structural lineament that separates the Pinjarra Orogen to the west, from the Yilgarn Craton to the east. The range extends for over 250 km, from Bindoon in the north to Collie in the south.

Bauxite deposits have been identified throughout the Darling Range and generally occur as erratically distributed alumina-rich lenses within the eroded laterites that mantle the granites to the east of the scarp line. The bauxites are thought to have formed from the lateritization of the peneplained surface of the Western Gneiss Terrane rocks. Lateritization is thought to have commenced during the Cretaceous and continued through to the Eocene, with the subsequent periodic activity of the Darling Fault resulting in the current landform of scarps and deeply incised valleys on the western edge of the Darling Range.

Most of the bauxites display a typical profile comprising the following sequence, from the top down:

- Overburden: A mix of soils, clays, rock fragments and humus that is typically 0.5 m deep, but deeper pockets are common.
- Hardcap: An indurated iron-rich layer that is usually 1 m to 2 m thick. It is generally high in available alumina (AL) and low in reactive silica (SI).

- Friable Zone: A partially leached horizon that usually contains a mix of caprock fragments, clasts, nodules, pisolites, and clays. It is usually a few meters thick but can exceed several meters in places. It is generally high in AL and low in SI.
- Basal Clay: A kaolinitic clay horizon that represents the transition zone between the Friable Zone and the underlying saprolitic material. It is generally high in SI and low in AL.

The Hardcap and Friable Zone are targeted as the ore horizon. Selective mining practices are applied to minimize the inclusion of Overburden, because of its elevated organic carbon levels, and Basal Clay because of its elevated SI concentrations. Within the Hardcap and Friable Zone, the dominant minerals, in order of abundance, are gibbsite, quartz, goethite, kaolinite, and hematite, with lesser amounts of anatase and muscovite.

1.3.6 Exploration

Systematic exploration for bauxite within the region commenced in the 1960s and is conducted on a continuous basis to maintain sufficient Resources and Reserves to meet refinery supply. Alcoa systematically drills the laterite areas on a regular grid spacing of 60 × 60 m, followed by successive infill programs in selected areas that reduce the spacing to 30 × 30 m, and finally to 15 × 15 m. The 2024 Mineral Resource estimates were derived from data acquired from a total of 420,789 holes, drilled between 1981 and 2024, with approximately 83% of the holes drilled after 2009.

The planned drill hole collar locations are pegged by Alcoa surveying staff using real time kinematic differential global positioning system (RTK DGPS). Prior to mid-2015, theodolite/ total stations and DGPS were used to position the 60 m spaced holes, and the 30 m and 15 m grids were positioned by taping and optical square sighting between the 60 m pegs. If the drill rig cannot be setup within 2 m of the peg, the offset distance is measured and marked on the driller's log. Alcoa has recently introduced the practice of resurveying all drill hole locations after drilling. However, the planned coordinates are used for subsequent modelling activities.

All holes are assumed to be vertical. However, the drill rigs have limited levelling capability, and most holes are orthogonal to the local surface gradient, resulting in deviations of several degrees from vertical.

A digital elevation model representing the natural surface was prepared from a combination of collar survey data, LiDAR data, and satellite imagery.

The drilling is conducted using a fleet of tractor-mounted vacuum rigs, which have been modified to operate in forested areas with minimal clearing or ground preparation. In 2015, Alcoa added aircore drilling rigs to the fleet. These rigs are also tractor-mounted and are fitted with a similar sample collection system to that used on the vacuum rigs. The rigs are fitted with hollow-bladed bits that have a nominal cutting diameter of 45 mm and an internal retrieval tube diameter of 22–25 mm.

All samples are collected on 0.5 m intervals, with the material extracted via the hollow drill stem into a collector flask attached to the cyclone underflow. Each sample, which weighs approximately 1.5 kg, is repeatedly passed through a riffle splitter to yield a retained split weighing approximately 200 g. This material is placed into barcode-labelled sample packets for dispatch to the test laboratory. The remaining material is discarded.

For each hole, the drillers prepare a log sheet that contains survey, drilling, geological logging, and sample submission information.

1.3.7 Mineral Resource Estimates

The long production history of Alcoa's ML1SA operations has resulted in the development of an integrated approach for data collection, bauxite delineation, and production planning, aimed at providing feedstock that meets the technical specification requirements of the local refineries. In the past few years, Alcoa recognized that some of its procedures required optimization and updating to be more consistent with best practice approaches within the industry. They commenced a process of investigation and revision of many of these procedures but recognized that this must be implemented in a staged manner to ensure that the Mineral Resources and Mineral Reserves delineation procedures remain consistent with, and do not result in significant disruption to, current mining practices. In 2019, they began introduction 3D block modelling techniques to replace the polygon and gridded seam modelling resource estimation procedures. Approximately 61% of the tonnages that contribute to the current Mineral Resource (exclusives Mineral Reserves) have been prepared using the new 3D block modelling procedures.

The majority of the estimates that make up the current Mineral Resource inventory were prepared using techniques that Alcoa has developed since the commencement of mining in 1963. Over the period, Alcoa developed an integrated approach to data collection, resource definition, and mining that has proven effective in meeting the refineries' feedstock requirements.

The development of the resource estimation procedures largely predates the wider industry move to block modelling and geostatistical estimation techniques that occurred in the 1990s. Although there have been numerous changes and refinements to Alcoa's procedures, these systems are essentially a semi-automated implementation of the traditional 2D polygonal estimation techniques.

A legacy of the development history of the resource estimation system is that different procedures were used to delineate Mineral Resources using the 30 m and 60 m spaced data, termed the ResTag procedures, compared to those defined using the 15 m spaced data, termed the Gridded Seam Model (GSM) procedures.

The estimates defined using the 15 m spaced data are limited to the material that is planned to be mined. The parameters used by Alcoa meant that the resultant estimates were essentially nearest neighbor polygonal estimates.

In essence, all techniques largely rely upon the definition of a resource floor based on AL and SI cut-off grade criteria applied to both individual and accumulated sample grades (for the traditional approaches) or individual and accumulated model grades (for the 3DBM approach). Minimum thickness criteria are also considered. For the models defined using the 15 m spaced data, practical mining constraints are also included in floor definition, including stripping ratios, and the floor heights in surrounding holes. The sample grades in each drill hole or column of model cells are composited over the interval between the base of overburden and the resource floor.

The lateral constraints are initially defined using AL and SI grade thresholds, and then modified to include minimum area, minimum composite numbers, and maximum internal waste criteria. Additional constraints are applied for the resources defined using 15 m spaced data. These include maintaining equipment transit corridors and including minimum buffer distances around environmental exclusion zones and bedrock outcrop.

The resource outlines are divided into resource blocks that delineate sub-regions containing material with similar grade characteristics, and contain tonnages that can be used for long-term, medium-term, and short-term scheduling activities (80 kt to 100 kt for 60 m spacing, down to 20 kt to 40 kt for 15 m spacing). For the 30 m and 60 m areas, the resource blocks are assigned the length-weighted average grades of the enclosed composites.

The model contains estimates for a range of constituents that are of prime importance for Bayer processing including AL, SI, oxalate, sulphate, boehmite, and iron. Validation included visual and statistical checks between the input data and resource block estimates, comparisons of the estimates derived from different data spacings, and comparisons of the estimates with production data.

The annual reconciliation data for the past 10 years indicate the presence of grade and tonnage biases which, although some show long-term trends, appear to be relatively consistent and predictable on a year-to-year basis. The As Mined tonnage estimates are consistently biased high by approximately 5%. The As Mined AL is biased low but has shown a gradual improvement from 5% to 1%, relative over the past decade. Reactive silica is the most variable element, showing lower differences for Huntly in previous years but reaching 20% in 2024, and displaying a higher variability pattern for Willowdale, usually above 10%.

The Mineral Resource classifications have been applied to the resource estimates based on consideration of the confidence in the geological interpretation, the quality and quantity of the input data, the confidence in the estimation technique, and the likely economic viability of the material.

There are limited quality assurance data to enable a thorough assessment of the reliability of the estimation datasets, and nowadays the minority of the Mineral Resource estimates (inclusive Mineral Reserves) have been prepared using traditional 2D estimation techniques which have known limitations when used to prepare local estimates. However, the long production history and significant amount of reconciliation data indicate that past estimates prepared using these techniques have been relatively reliable and predictable.

Based on the above considerations, the main controlling factors for Mineral Resource classification are deemed to be sample spacing, geological modelling and block model criteria, and data quality.

1.3.8 Mineral Reserve Estimates

A Mineral Reserve has been estimated for Alcoa's Darling Range bauxite mining operations in accordance SEC S–K 1300 which are consistent with the guidelines of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves (the JORC 2012 Code).

The QP inspected the Alcoa Huntly and Willowdale operations and site Mine Planning Department between October 8th and 9th 2024 and visited Alcoa's Mine Planning offices in Booragoon on October 10th and 11th 2024, interviewing relevant personnel on these dates and on other occasions. The QP has prior knowledge of the asset being involved in the previous Mineral Reserve Statement in the preceding years (2021, 2022, and 2023).

The Mineral Reserve is classified with reference to the classification of the underlying Mineral Resource and with reference to confidence in the informing Modifying Factors. The QP considers the Proven and Probable classification to be appropriate to the deposit and associated mining operations.

The reference point for the Mineral Reserve is prior to the processing plant at the refinery.

The Proven Mineral Reserve is a subset of Measured Resources only. The Proven Mineral Reserve is included in the Long Term Mine Plan (LTMP) and is approved for mining.

The Probable Mineral Reserve is estimated from that part of the Mineral Resource that has been classified as Indicated or from Measured resources that are not yet approved for mining.

Variable cut-off grades are applied in estimation of the Mineral Reserve, and these are related to operating cost and the nature of the Mineral Resource in relation to blending

requirements. The Mineral Reserve estimate is expressed in relation to available aluminum oxide (AL) and reactive silica (SI), this being the critical contaminant in relation to the Refinery.

1.3.9 Mining Methods

The Huntly and Willowdale mines employ conventional open pit mining practices and equipment. The fleet is mixed between contract and owner-operator, depending on the nature of the task at hand. Owner operator equipment is used for mining the bulk of the Mineral Reserve, operating in areas away from those subject to environmental restrictions. Contract mining operates smaller equipment, day shift only, in environmentally (noise) sensitive areas and at the perimeter of the mining area.

Following definition of Mineral Reserve blocks, vegetation is cleared ahead of mining by the Western Australian State Forest Products Commission (FPC), saleable timber being harvested for use. On receipt of clearance to proceed from the FPC, Alcoa operations commence stripping topsoil and secondary overburden removal (SOBR) using small excavators, scrapers, and trucks. Soil is stockpiled at the site, away from the proposed pit, for rehabilitation purposes.

Mining progresses on 4 m benches, utilizing a contour-mining sequence, cutting benches across the topography, working from top to bottom, maintaining the flattest floor obtainable to a maximum overall gradient of 1:10. This is most pronounced in steep areas. Most of the mineralization lies beneath a gently undulating topography and contour mining is minimal.

After completion of mining, overburden is progressively backfilled into adjacent exhausted pits, topsoiled and rehabilitated by re-establishment of native vegetation, creating a stable post-mining landform that replicates the pre-existing environment.

1.3.10 Processing and Recovery Methods

The QP notes in accordance with the mine planning reviewed, total ($T.SiO_2$) and SI contents, on an annual average basis, remains on the target for refineries for the next nine years. This means, there are no evidence of any deleterious element's presence in the Darling Range ore within the next nine years of production.

The process plant for the Darling Range operations consists of two separate crushing facilities at the Huntly and Willowdale mines. Both facilities crush the Run-of-Mine (ROM) and currently convey the crushed ore to two separate refineries located at Pinjarra and Wagerup.

The power consumption of the Huntly operation is approximately 5,500 MWh to 6,500 MWh per month. The Willowdale power consumption is approximately 2,000 MWh per month.

The process plant is a dry crushing operation and therefore water is only required for dust suppression and is included as part of mine water consumption. Water is not required as a consumable for the plant.

1.3.11 Infrastructure

The infrastructure for the mining operations is established and operational. During 2021, the infrastructure hub for Willowdale was relocated 16 km southwards from Orion (after having been based there for 21 years) to the Larego Hub which is located about 20 km north-east of the town of Harvey. The hub hosts new administrative offices, as well as crushing facilities and maintenance facilities. The Orion Hub site has been decommissioned.

Extensive haul road networks, rail, and overland conveyors transport crushed bauxite from the Hubs to the refineries (namely Kwinana, Wagerup and Pinjarra). Bauxite is transferred from each mine to the refineries primarily via long distance conveyor belt, apart from the

Kwinana refinery which receives bauxite via railway. The Alumina produced by the refineries is then currently shipped to external and internal smelter customers through the Kwinana and Bunbury ports.

As intended, the Kwinana refinery ceased production in the second quarter of 2024 following phased curtailment announced in January 2024. The updated mine plans have been revised accordingly. The Darling Range's Pinjarra refinery receives power from the South West Interconnected System (SWIS). The refinery also has internal generation capacity of 100 MW from four steam driven turbine alternators, with steam produced by gas fired boilers and a gas turbine Heat Recovery Steam Generator (HRSG). The refinery supplies power to the Huntly Mine by three different power supply lines (a single 33 kV and two 13.8 kV). Willowdale Mine has a single 22 kV power supply fed from the Wagerup refinery. The Wagerup refinery is a net exporter of power to the SWIS, with internal generation capacity of 108 MW from three steam driven turbine alternators and one gas turbine. The steam is produced by gas fired boilers.

The WA mines are licensed by the Department of Water and Environmental Regulation (DWER) to draw surface water from five locations to meet their water supply requirements. The Huntly mine draws water from Banksiadale Dam and Boronia Waterhole. Huntly mine also holds a license to draw water from Pig Swamp and Marrinup, however these resources are retained as a backup water supply and have not been utilized in recent years. Huntly mine is also permitted to draw water from South Dandalup Dam under an agreement with the Water Corporation. A pumpback facility from South Dandalup Dam to Banksiadale Dam is used to raise levels in Banksiadale Dam during periods of low rainfall runoff. Willowdale Mine draws water from Samson Dam.

There are no Alcoa accommodation facilities within the Darling Range. As described above, the Huntly and Willowdale mining areas are within proximity to established population centers including Pinjarra approximately 30 km to the southwest of Huntly and Waroona approximately 20 km northwest of Willowdale. Onsite facilities include offices, ablutions, crib-rooms and workshops, all of which were observed to be in excellent condition.

No tailings are generated within the boundaries of the mining operations. The management of tailings generated downstream at the refineries is beyond the boundaries of the Darling Range mining operations and are therefore not considered in this TRS. Alcoa's Darling Range mining operations do not produce mine waste or "mullock" in the same manner as conventional mining operations and waste dumps are not constructed.

1.3.12 Market Studies

Alcoa Corporation is a vertically integrated aluminum company comprising bauxite mining, alumina refining, aluminum production (smelting and casting), and energy generation.

Through direct and indirect ownership, during 2024 Alcoa Corporation had 27 locations in nine countries around the world, situated primarily in Australia, Brazil, Canada, Iceland, Norway, Spain, and the United States. Governmental policies, laws and regulations, and other economic factors, including inflation and fluctuations in foreign currency exchange rates and interest rates, affect the results of operations in these countries.

There are three commodities in the vertically integrated system: bauxite, alumina, and aluminum, with each having their own market and related price and impacted by their own market fundamentals. Bauxite, which contains various aluminum hydroxide minerals, is the principal raw material used to produce alumina. Bauxite is refined using the Bayer process to produce alumina, a compound of aluminum and oxygen, which in turn is the raw material used by smelters to produce aluminum metal.

Alcoa obtains bauxite from its own resources and processes over 80% of its combined bauxite production into alumina.

China is the largest third-party seaborne bauxite market and accounts for more than 90% of all bauxite traded. Bauxite is sourced primarily from Australia, Guinea, and Indonesia on the third-party market. In the long run, China is expected to continue to be the largest consumer of third-party bauxite with Guinea expected to be the majority supplier. Further, third-party traded bauxite is expected to be in surplus over the next decade, with most new mining projects announced recently being located in Guinea.

Bauxite characteristics and variations in quality heavily impact the selection of refining technology and refinery operating cost. Bauxite with high impurities could limit the customer volume an existing refinery could use, resulting in a discount applied to the value-in-use price basis.

Besides quality and geography, market fundamentals, including macroeconomic trends – the prices of raw materials, like caustic soda and energy, the prices of Alumina and Aluminum, and the cost of freight – will also play a role in bauxite prices.

In 2016, Darling Range entered into a 5-year third-party sales contract with a major alumina producer in China. Following the expiration of the third-party sales contract at the end of 2021, all bauxite production from Huntly and Willowdale was consumed internally by the Darling Range.

Alcoa determines economic cut-off grade by deducting operational costs (mining, refining etc) from a base alumina price of USD 400 per tonne. This approach is described in more detail in Section 12.7.

As per previous disclosures, the bauxite price utilized in the mine cashflow is represented by an intercompany price, indicative of mine sales to the refinery, inflated by 3% YoY. The weighted average of this price is $23.19/t over the detailed mine plan period of nine years.

1.3.13 Environmental Studies, Permitting and Plans, Negotiations, or Agreements with Local Individuals or Groups

Alcoa has established practices and processes for enabling conformance to environmental requirements. Sensitive areas are identified and managed ahead of disturbance. Environmental factors are considered prior to infill drilling; hence, mining blocks carrying environmental risks do not feature in the Mineral Reserves (for example, areas around granite outcrops and water courses have a buffer applied and are essentially no-go areas from a mining perspective). Mining in some areas became more constrained in 2023 as a result of internal and external factors, which continued into 2024.

The Final 2023-2027 MMP was developed by Alcoa and approved by the Minister for State Development in December 2023. The MMP describes the way in which Alcoa mines within Mining Lease ML1SA at Huntly and Willowdale. For example, Alcoa undertakes surveys to inform the mine plan development, facilitate characterization of ore quality and volumes, assess geotechnical conditions, identify constraints and protect or manage important environmental, cultural heritage and social values.

As was reported in the previous TRS:

- Reduce mining activities inside higher risk areas within drinking water catchments.
- Alcoa will not undertake any new pit clearing in any areas with an average pit slope greater than 16% within any Reservoir Protection Zone (RPZ, 2 km from reservoir top water level).
- Increase rehabilitation and reduce open areas where possible, with priority in higher risk areas.
- Maximum annual clearing footprint of 800 ha.

- Revise the Rehabilitation Completion Criteria by 31 December 2024, in consultation with DBCA.

Alcoa is modernizing its environmental approvals framework for the Huntly Bauxite Mine by referring future mining plans beyond the scope of the 2023-2027 MMP for assessment under Part IV of the Western Australian *Environmental Protection Act 1986* (EP) and the Australian *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The future mining plans that have currently been referred to both state and federal departments propose to transition the Huntly Mine into the proposed Myara North and Holyoake mine regions within Alcoa's Mining Lease ML1SA.

The resulting Environmental Impact Assessments (EIAs) under State and Federal legislation will inform stakeholders on long-term mine plans and environmental management requirements and facilitate the setting of approval conditions.

Importantly, on 14 December 2023 the State Government announced the *Alcoa Transitional Approvals Framework* which will enable Alcoa to continue mining as defined in the 2023-2027 MMP while the formal Western Australian Environmental Protection Authority (EPA) EIA is in progress. In most circumstances, activities under assessment must cease during the EPA's process. Note, that the State Government reserves the right to, with reasonable notice, withdraw or amend the exemption at any point. In October 2024 the Premier rolled over the 2023-2027 approval to cover 2024-2028 with the same conditions.

Importantly, based on reports provided under Clause 10 of the 2023 Exemption Order for January to June of 2024, Alcoa has been able to comply with increased regulatory requirements while the EPA formally assesses the 2022-2026 and 2023-2027 MMPs.

As reported in the TRS for 2022, numerous baseline studies have been completed to support approvals for future extensions to the mining footprint to the Myara North and Holyoake regions. Baseline studies are guided by the requirements of the EPA and guidelines under the EPBC Act and are well understood.

Construction for Myara North will be commenced pursuant to the requirements of the Ministerial Decision, which will be issued upon completion of the EPA assessment process indicatively forecast for the first quarter of 2026, as opposed to approximately mid-2025 as reported in the TRS for 2023. The timeframe to approval of Myara North and Holyoake under the EP Act and EPBC Act can be estimated, but not predicted with certainty; further delays are possible.

There is no requirement for the monitoring of any tailings or mine waste dumps associated within the mining operations as:

- No tailings are generated within the boundaries of the mining operations.
- Alcoa's Darling Range mining operations do not produce mine waste - waste dumps are not constructed. Overburden from Darling Range ore blocks is carefully segregated for later contouring and rehabilitation of adjacent, completed mining operations. Caprock and other non-viable rock is used to backfill these shallow, completed pits and the viable topsoil is spread on top, contoured, and revegetated.

Alcoa's mine sites are monitored in accordance with the conditions of Government authorizations and its operational licenses at Huntly (L6210/1991/10) and Willowdale (L6465/1989/10). Outcomes of and compliance with the management and monitoring programs are tracked within Alcoa's Environmental Management System and reported within the Annual Environmental Review report:

- Review of the most recent report, JTSI Annual Environmental Review 2023 (dated April 2024), largely reported compliance with environmental commitments and success of operational controls to manage environmental objectives.

- The increase in spills reported in the previous TRS has been reversed in 2023.

Alcoa has established systems and processes for maintaining its social license to operate and was admitted to the International Council on Mining and Metals (ICMM) in 2019, aligning to its social performance requirements. Related to the requirements of the BSEC, Alcoa's actions include an annual 5-year consultation process aligned with the 5 Year Mine Plan. The consultation process involves engaging with affected landowners. Alcoa's consultation extends to shires, as well as state and local government.

Alcoa has established systems and processes to support maintenance of its social license to operate and conducts an extensive program of community relations activities to ensure that the public is aware and informed regarding its operations.

Alcoa strives to align its social performance and community engagement to global leading practice and was admitted to ICMM in 2019. In addition, Alcoa's Western Australian operations are certified under the Aluminum Stewardship Initiative, valid until 16 January 2026.

Alcoa has formally consulted and engaged survey work from the relevant Traditional Owners across its operational footprint. Following a joint review of the Draft Cultural Heritage Management Plan late in 2024, Alcoa and Gnaala Karla Boodja have agreed that further work is required to finalise the document. In view of Gnaala Karla Boodja Aboriginal Corporation's capacity constraints, it is likely that finalization of the Cultural Heritage Management Plan will require a minimum of a further six months. A formal request for an extension of time to facilitate this has been submitted to the relevant Government regulator.

Alcoa's Social Performance Management System (SPMS), SP360, is in place across its global operations. The SPMS supports locations to undertake effective engagement with communities, manage their social risks, and maintain Alcoa's Social License to Operate.

Alcoa's Closure Planning and Execution staff for Darling Range are located across multiple teams. The closure staff within the Global Planning Team are primarily responsible for developing the Long-Term Mine Closure Plans (LTMCPs) and life of asset planning of Alcoa's WA Mining Operations (Huntly and Willowdale). Short to Medium terms closure planning and execution is developed across organizational divisions and includes multidisciplinary inputs such as from Operations, Mid- and Short-term Planning, Finance, Centre for Excellence, Environment and Asset Management (both Fixed and Mobile Plant). The agreed closure requirements for Darling Range centers around the return of Jarrah Forest across the site.

The Alcoa procurement system defines "local" as the localities of Dwellingup, Harvey, Pinjarra, Waroona, Coolup, North Dandalup, Jarrahdale and Yarloop. Within Alcoa's guidelines of safe, ethical, and competitive business practices, they state they will:

- Invite capable local businesses to bid on locally supplied or manufactured goods or services.
- Give preference to local business in a competitive situation.
- Work with local business interest groups to identify and utilize local suppliers.
- Where possible, structure bids to enable local supplier participation.

Alcoa also endeavors to add value to Traditional Owners and the local economy through the use of businesses owned by Traditional Owners, businesses that employ and work with Traditional Owners and locally owned businesses.

1.3.14 Capital and Operating Cost Estimates

Alcoa forecasts its capital and operating costs estimates based on annual budgets and historical capital and operating costs over the long life of the current operation.

1.3.14.1 Capital Costs

The operation is well-established, and the LOM plan outlines capital expenditures aligned with scheduled production rates throughout the mine's life. This includes future capital expenditures for major mine relocations to meet anticipated refinery production while sustaining ongoing operations.

Projected mine capital expenditure over the next nine years of mine life is estimated to total $1,175 million, although this will include capital outlay required to extend the mine life much beyond the nine-year period covered by the valuation. Of this total, it is understood that $182 million is associated with completing the mine move to the Myara North site. Capital for the Holyoake move is estimated to be $471 million.

A breakdown of the major expenditure areas and total expenditure over the Mine Plan is shown in Table 1-3.

Table 1-3: Nine Year LOM Sustaining Capital Costs by Area

Project	Cost $ Million	Percentage of Total
Mine Moves	787	67.0%
Conveyor Belt Replacements	53	4.5%
Haul Road Improvements	136	11.6%
Other Sustaining capital	199	16.9%
Total	**1,175**	**100%**

Other capital costs are for replacement of conveyors, haul road improvements and other sustaining capital needed to continue the operations.

Alcoa's sustaining capital estimates for Darling Range are derived from annual budgets and historical actuals over the long life of the current operation. According to the American Association of Cost Engineers (AACE) International, these estimates would generally be classified as Class 1 or Class 2 with an expected accuracy range of -3% to -10% to +3% to +15%.

1.3.14.2 Operating Costs

The main production mining operations are primarily Owner-operated using Alcoa equipment and employees. Contractors are also used for certain activities on site.

Operating costs for the current LOM of nine years are based on the 2024 long-term plan.

No items have been identified that would significantly impact operating costs either positively or negatively over the life of mine. Minor year-to-year variations should be expected based upon maintenance outages and production schedules. It should be noted that the current mine plans and operational cost projections reviewed by the QP now accommodate the Kwinana refinery curtailment (which was completed in June 2024).

Forecast costs for 2025 and average mine operating costs for the nine-year LOM are shown below in Table 1-4.

Table 1-4: LOM On-site Mine Operating Costs by Category*

Cost Centre	2025 ($/wmt)	Average LOM ($/wmt)	Percentage of Operating Cost
Direct Labor	$3.70	$4.13	32%
Services	$1.83	$1.16	9%
Other	$1.48	$3.01	24%
Corporate Chargebacks for support services	$1.08	$0.80	6%
Energy	$0.23	$0.10	1%
Fuel	$0.67	$0.77	6%
Operating Supplies and Spare Parts	$0.79	$0.92	7%
Maintenance (fixed plant and mobile fleet)	$1.17	$1.91	15%
Mine Operating Cash Cost ($/wmt)	**$10.95**	**$12.80**	**100%**
Off-site Costs			
G & A, selling and other expenses	$0.85	$0.57	
R & D Corporate Chargebacks	$0.13	$0.06	
Other COGS	$0.15	$0.12	
Total Cash Operating Costs	**$12.08**	**$13.55**	

**Due to rounding, numbers presented may not add up precisely to the totals provided.*

Services costs include contractor costs for certain mining activities such as in noise sensitive areas and for haul road construction services, in select areas of pit development, and during landscaping activities for rehabilitation after mining.

As of December 2024, the Huntly and Willowdale operations together employ 981 employees consisting of 36 technical, 122 management and 823 operations employees. Additionally, 171 employees are centrally employed on the combined operations.

2.0 Introduction

SLR International Corporation (SLR) was appointed by Alcoa Corporation (Alcoa) to prepare an independent Technical Report Summary (TRS) on the Darling Range bauxite mines, located in Western Australia. The purpose of this report is to support the Mineral Resource and Mineral Reserve estimates for the mines as of December 31, 2024. This TRS conforms to the United States Securities and Exchange Commission's (SEC) Modernized Property Disclosure Requirements for Mining Registrants as described in Subpart 1300 of Regulation S-K, Disclosure by Registrants Engaged in Mining Operations (S-K 1300), and Item 601(b)(96) of Regulation S-K. This Technical Report Summary updates the TRS titled "Technical Report Summary for Darling Range, Western Australia," with an effective date of December 31, 2023, that was prepared in accordance with S-K 1300 and Item 601(b)(96) by SLR for Alcoa.

Alcoa is one of the world's largest aluminum producers and is a publicly traded company on the New York Stock Exchange (NYSE). The company owns and operates integrated bauxite mining, alumina refining and aluminum smelting operations at numerous assets globally across nine countries. Alcoa is also a Joint Venture partner for several other integrated operations in Brazil, Canada, Guinea, and Saudi Arabia. Regarding the latter, in September 2024 Alcoa announced an agreement to sell its 25.1% stake in the Ma'aden Joint Venture to Ma'aden.

The Darling Range, located south of Perth in Western Australia, comprises two active bauxite mining areas – the Huntly and Willowdale mines – owned and operated by Alcoa Corporation (Alcoa). The Huntly and Willowdale operations collectively represent one of the world's largest bauxite mines which currently supplies Alcoa's alumina refineries Pinjarra and Wagerup. On the basis that both mining areas supply ore to the same local refineries which are also operated by Alcoa, and that both mining areas are located within the same mining lease boundary, SLR considers the mines a single property for the purposes of this report.

Alcoa has a long history of mining in the Darling Range with Huntly and Willowdale commencing commercial production in 1972 and 1984 respectively. These mining areas were preceded by the Jarrahdale bauxite mine which was operational between 1963 and 1998. The Huntly mine currently supplies bauxite to the Pinjarra refinery, while the Willowdale mine supplies the Wagerup refinery. The mines collectively supply approximately 27 Mtpa of bauxite, with approximately 17 Mtpa from Huntly and 10 Mtpa from Willowdale. For the purposes of this report, available alumina ($A.Al_2O_3$) is abbreviated to AL, and reactive silica ($R.SiO_2$) is abbreviated to SI.

2.1 Site Visits

SLR Qualified Persons (QPs) for Geology/Resources and Mining/Reserves visited the sites between 07 October to 11 October, 2024. The SLR Geologist and SLR Mining Engineer were accompanied by various Alcoa personnel to undertake site visits, inspections of various aspects of the Huntly and Willowdale mining areas. Further discussions on reconciliation, geological modeling, long term mine planning, and permitting were undertaken at the Booragoon office. Table 2-1 below provides a summary of the site visit. Alcoa provided permission to document the site visit with video, photos, and audio which were shared with the other SLR team members. Further, an SLR Environmental practitioner attended some of the corporate meetings regarding Surveys/Approvals/Reconciliation/Regional Environmental to inquire about pertinent items such as the site constraints and other aspects of rehabilitation (as part of the broader Modifying Factor review).

Table 2-1: Site Visit Summary

Date	Day	Tasks / Areas of Investigation	Comments
07-Oct	Mon	Modelling update	-
08-Oct	Tues	Willowdale Mine tour	Inspect pre-mining process and mining operation
		Capital Plan/Environmental Operations/WDL MTP	Capital Plan, Environmental, and MTP discussions at Pinjarra Hub
09-Oct	Wed	Mine tour for Huntly Mine Myara	Inspection of rehabilitation planning & process, and rehab operations
		Economics, Financial modelling/GIS for Environmental reporting and constraint management	Finance and GIS discussions at Pinjarra Hub
10-Oct	Thurs	Long and Medium Term Mine Plans	LTMP for Huntly and Willowdale, MTP for Huntly
		Surveys/Approvals/Reconciliation/Regional Environmental discussions	Heritage process/MMP and Part IV Approvals/Reconciliation
11-Oct	Fri	Reporting approach/Review feedback, plus Contingency and Follow Up	Meet with Global Planning Team

2.2 Sources of Information

During the preparation of this Technical Report Summary, discussions were held with personnel from Alcoa Corporation and the Huntly and Willowdale Mines, as below:

Table 2-2: List of Alcoa staff who had input into discussions with SLR QPs

Name	Position	Department	Area of responsibility
Alex Hatch	Principal Geologist	Global Planning	Geology - Review Coordinator
Wayne Baird	Pre-mining co-ordinator	Willowdale	Operational Planning
Bowen Zhang	Mine Planning Engineer	WA Mining	Medium Term Planning - Willowdale
William Ong	Rehabilitation Planning Engineer	Huntly Mine	Operational planning
Peter Ladyman	Rehabilitation Superintendent	Huntly Mine	Operations
Deborah May	WA Mining Controller	WA Mining	Finance
Luke Gossage	Environment Manager	WA Mining	Environmental Operations
Rishi Kumar	Senior Mining Engineer	Mining CoE	Mining Improvement Projects - Reconciliation
Francois Vorster	Project Director	Major Projects	Myara North/Holyoake/O'neil
Matt George	Regional Spatial Manager	Global Planning	GIS
Neylor Aguiar	Principal Mining Engineer	Global Planning	Long Term Mine Planning - Darling Range

John Un	Senior Mine Planning Engineer	Global Planning	Long Term Mine Planning - Darling Range (Ex MTP Huntly)
Lucas Tuckwell	Senior Resource Geologist	Global Planning	Geology - Resource/Reserve Modelling
Kane Moyle	Director of Regulatory Approvals	Regulatory Approvals	Regulatory Approvals - MMP and transition
Ashley Bird	Regulatory Approvals Manager	Regulatory Approvals	Regulatory Approvals - Part 4/5/EPBC
Angela Murphy	Cultural Heritage Lead	Sustainability	Indigenous engagement/Cultural Heritage
Jennifer Longstaff	Director Environment Australia	Environmental CoE	Regional Environmental
Karthik Sampath	Global Planning Director	Global Planning	Planning
Alex Greaves	Global Mine Planning Manager	Global Planning	Mine Planning

The documentation reviewed, and other sources of information, are listed at the end of this report in Section 24.0.

2.3 List of Abbreviations

Units of measurement used in this report conform to the metric system. All currency in this report is United States dollars (US$), unless otherwise noted.

Abbreviation	Description
$	United States Dollars
°C	degree Celsius
°F	degree Fahrenheit
2D	2-dimensional
3D	3-dimensional
3DBM	3D Block Model
a	Annum
A	Ampere
A.Al_2O_3 or AL	available alumina
AACE	American Association of Cost Engineers
AFFF	Aqueous Film Forming Foams
AGD	Australian Geodetic Datum
Alcoa	Alcoa Corporation
Alcoa US	Aluminum Company of America Ltd
AMG	Australian Map Grid
AMPD	Absolute Mean Percentage Difference
AMSL	above mean sea level
AMWU	Australian Metal Workers Union

AofA	Alcoa of Australia Ltd
API	Alumina Price Index
ARO	Asset Retirement Obligations
AWAC	Alcoa World Alumina and Chemicals
AWU	Australian Workers Union
B&P	Bias and Precision
bbl	barrels
BD	Bomb digest
BD-GC	bomb digest gas chromatography
BD-ICP	bomb digest inductively coupled plasma
BD-NDIR	bomb digest non-dispersive infrared
Bella	Bella Analytical Systems
BSEC	Bauxite Strategic Executive Committee Bauxite
Btu	British thermal units
BV	Bureau Veritas
C$	Canadian dollars
cal	calorie
CalVal	calibration and validation for FTIR
cfm	cubic feet per minute
CIM	CIM (2014)
cm	centimeter
cm²	square centimeter
CV	Coefficient of Variation
d	Day
DBCA	Department of Biodiversity, Conservation and Attractions
DCF	Discounted Cash Flow
DEM	Digital Terrain Model
DG	Discrete Gaussian
DGPS	(Differential) Global Positioning System
dia	Diameter
DIBD	dry in situ bulk density (t/m3)
DJTSI	Department of Jobs, Tourism, Science and Innovation
DMIRS	Department of Mines Industry Regulation and Safety
dmt	dry metric tonne
DWER	Department of Water and Environment Regulation
dwt	dead-weight ton
EMS	Environmental Management System
ETU	Electrical Trades Union

EWR	Ecological water requirements
FEL	Front End Loading
FMS	Fleet Management System
FPC	Forest Products Commission
FS	Feasibility Study
ft	foot
ft/s	foot per second
ft²	square foot
ft³	cubic foot
FTIR	fourier transform infrared spectrometry
g	gram
G	giga (billion)
g/L	gram per liter
g/t	gram per tonne
Gal	Imperial gallon
GC	gas chromatography
Geological Survey	Geological Survey of Western Australia
GIS	Geographical Information System
Gpm	Imperial gallons per minute
gr/ft³	grain per cubic foot
gr/m³	grain per cubic meter
GSM	gridded seam model
ha	hectare
HARD	Half Absolute Relative Difference
hp	horsepower
hr	hour
HRSG	Heat Recovery Steam Generator
Hz	Hertz
ICP-OES	inductively coupled plasma optical emission spectrometry
IDW	inverse distance weighting
ID2	inverse distance squared
in.	inch
in²	square inch
IRM	internal reference material
IRR	Internal Rate of Return
ISO	International Standardization Organization
J	Joule
JORC	JORC Code (2012)

k	kilo (thousand)
kcal	kilocalorie
kg	kilogram
km	kilometer
km/h	kilometer per hour
km²	square kilometer
kPa	kilopascal
kV	kilovolt
kVA	kilovolt-amperes
kW	kilowatt
kWh	kilowatt-hour
KWI	Kwinana Mining Laboratory
L	liter
L/s	liters per second
lb	pound
LiDAR	Light Detecting and Ranging
LIMS	laboratory information management system
LME	London Metal Exchange
LOM	Life of Mine
LTMCPs	Long-Term Mine Closure Plans
LTMP	Long Term Mine Plan
m	micron
m	meter
M	mega (million); molar
m²	square meter
m³	cubic meter
m³/h	cubic meters per hour
Ma	Million years ago
MALSI	microwave available alumina (AL) and reactive silica (SI)
MASL	meters above sea level
MD	microwave digest
MD-ICP	microwave digest inductively coupled plasma optical emission spectrometry
mg	microgram
mi	mile
min	minute
mL	milliliters
ML	Mineral Lease
mm	millimeter

MMPLG	Mining and Management Program Liaison Group
MMPs	Mining and Management Programs
mph	miles per hour
MS	Ministerial Statement or Magnetic Susceptibility
MTP	Medium Term Plan
Mtpa	Million tonnes per annum
MVA	megavolt-amperes
MW	megawatt
MWh	megawatt-hour
NATA	Australian National Association of Testing Authorities
NI 43-101	National Instrument 43-101 (2014)
NN	Nearest Neighbor
NPC	Net Present Cost
NPV	Net Present Value
NTU	Nephelometric Turbidity Units
NYSE	New York Stock Exchange
OK	ordinary kriging
oz	Troy ounce (31.1035g)
oz/st, opt	ounce per short ton
PFAS	per- and polyfluoroalkyl substances
ppb	part per billion
ppm	part per million
psia	pound per square inch absolute
psig	pound per square inch gauge
QA	Quality Assurance
QA/QC	Quality Assurance / Quality Control
QC	Quality Control
QP(s)	Qualified Person(s)
R.SiO_2 or SI	reactive silica
RC	Reverse Circulation
REF	reference method
ResTag	mineral resource estimation system
RL	relative elevation
ROM	Run of Mine
RPEE	Reasonable Prospects for Economic Extraction
RTK	real time kinematic
s	second
SEC	Securities and Exchange Commission

S-K 1300	Subpart 1300 of Regulation S-K
SLR	SLR International Corporation
SMU	Single Mining Unit
Snowden	Snowden Mining Consultants
SOBR	stripping topsoil and secondary overburden removal
SPU	sample presentation unit
SRK	SRK Consulting (Australasia) Pty Ltd
st	short ton
STE	sample to extinction
stpa	short ton per year
stpd	short ton per day
SWIS	South West Interconnected System
t	metric tonne
T.Al_2O_3	Total Alumina
T.SiO_2	Total silica
TICTOC	Total Inorganic Carbon and Extractable Organic Carbon
tpa	metric tonne per year
tpd	metric tonne per day
TRS	Technical Report Summary
US$	United States dollar
Usg	United States gallon
Usgpm	United States gallon per minute
V	volt
W	watt
WA	Western Australia
WANL	Western Aluminum NL
WMC	Western Mining Corporation Ltd
wmt	wet metric tonne
wt%	weight percent
XRD	x-ray diffraction
XRF	x-ray fluorescence
Xstract	Xstract Resources
yd^3	cubic yard
yr	Year

3.0 Property Description

3.1 Location

The Darling Range is located in the southwest of Western Australia and comprises an extensive uplifted plateau of bauxite deposits which is host to several mining operations including the Huntly and Willowdale mining areas, approximately 80 km and 100 km southeast of Perth, respectively. The nearest towns to the mining centers are North Dandalup (approximately 15 km west of Huntly) and Waroona (approximately 20 km northwest of Willowdale). Both towns are within the Peel Region of southwest Western Australia and are on the route of the South Western Highway, a major national road connecting Perth with the south coast.

All spatial data used for Mineral Resource estimation are reported using a local grid based on Australian Map Grid 1984 (AMG84) system (Zone 50) and using Australian Geodetic Datum 1984 (AGD84) coordinate set. The approximate coordinates of the mining areas are 410000 m East and 6390000 m North (Huntly) and 410000 m East and 6365000 m North (Willowdale). The Huntly and Willowdale mining areas are separated by approximately 35 km (Figure 3-1).

The Pinjarra refinery is located adjacent to the east of the town of Pinjarra and is approximately 25 km southwest of the Huntly mining areas. The Wagerup refinery, supplied by Willowdale, is located immediately adjacent to the east of the South Western Highway, approximately 8 km south of Waroona and 20 km west of the Willowdale mining area. The Kwinana refinery, previously supplied by Huntly, was curtailed in 2024, and lies approximately 50 km northwest of Huntly in the city of Kwinana, a suburb approximately 40 km south of Perth.

3.2 Land Tenure

The Huntly and Willowdale bauxite mines are covered by a single mineral concession referred to as Mineral Lease (ML) 1SA. The concession was originally granted on September 25, 1961, by the State Government of Western Australia under the Alumina Refinery Agreement Act, 1961, permitting the exploration and extraction of bauxite. ML1SA was granted for a period of four, 21-year periods, the fourth period of which is due to expire on September 24, 2045. The State Government concession agreement includes the potential for conditional renewal beyond 2045. This will require negotiation between Alcoa and the State Government prior to this date to agree on an extension of the agreement and is therefore not guaranteed.

Conditions which must be fulfilled by Alcoa to retain ML1SA include annual reporting requirements under several State Agreement Acts, Ministerial Statements, and Environmental Protection Acts. These are described in Section 3.6 below.

The current concession of ML1SA covers an area of 7,022.61 km², extending from the north of Perth on the eastern side to the town of Collie in the south (Table 3-1). Alcoa has the exclusive right to explore for and mine bauxite on all Crown Land within the ML1SA; however, a number of environmental and statutory constraints exist within the area, and Alcoa is not permitted to access bauxite from the areas covered under these constraints. For example, the 2023-2027 MMP requires:

- A reduction in mining activities inside higher risk areas within drinking water catchments.
- Alcoa cannot undertake any new pit clearing in any areas with an average pit slope greater than 16% within any Reservoir Protection Zone (RPZ, 2 km from reservoir top water level).

- An increase in rehabilitation and reduction in open areas.
- A maximum annual clearing footprint of 800 ha.

The ML1SA area includes sub-lease arrangements made between Alcoa and the Worsley Alumina joint venture participants which include South32, Japan Alumina Associates (Australia) Pty Ltd and Sojitz Alumina Pty Ltd (Worsley Participants). The agreements, made in August 2001 and September 2016, provide bauxite mining concessions to the Worsley Participants. No Mineral Resources or Mineral Reserves attributable to the Darling Range mining areas have been declared within these sub-lease areas.

Table 3-1: ML1SA License Details

Concession Name	Title Holder	Expiry Date	Area (km²)
ML1SA	Alcoa of Australia	24/09/2045	7,022.61

Alcoa pays rental for each square mile of ML1SA in accordance with the Alumina Refinery Agreement Act 1961 (WA). In 2024, this amounted to A$13,560.

The boundary of the ML1SA concession area, including the limit of the Worsley Participants' area, is illustrated in Figure 3-1. The contained Mining Regions are shown in Figure 3-4, while the extents of the mined areas and Mineral Resources and Mineral Reserves are shown in Figure 3-3.

The mining rights and assets involved with bauxite mining and alumina refining in Australia are 100% owned by Alcoa of Australia Limited (AofA), an affiliate of Alcoa owned by Alcoa World Alumina and Chemicals (AWAC). Prior to Alcoa's acquisition of Alumina Limited, Alcoa Corporation and Alumina Limited owned 60% and 40%, respectively, of AWAC, an unincorporated global joint venture consisting of a number of affiliated entities that own, operate, or have an interest in bauxite mines and alumina refineries, as well as an aluminum smelter, in seven countries. In August 2024 Alcoa completed the acquisition of Alumina Limited, putting the AWAC joint venture under full control and ownership of Alcoa. As a result, Alcoa owns 100% of AofA and, indirectly, 100% of the mining rights and assets involved with bauxite mining and alumina refining in Australia.

Figure 3-1: ML1SA Lease Extents (Alcoa, 2024)

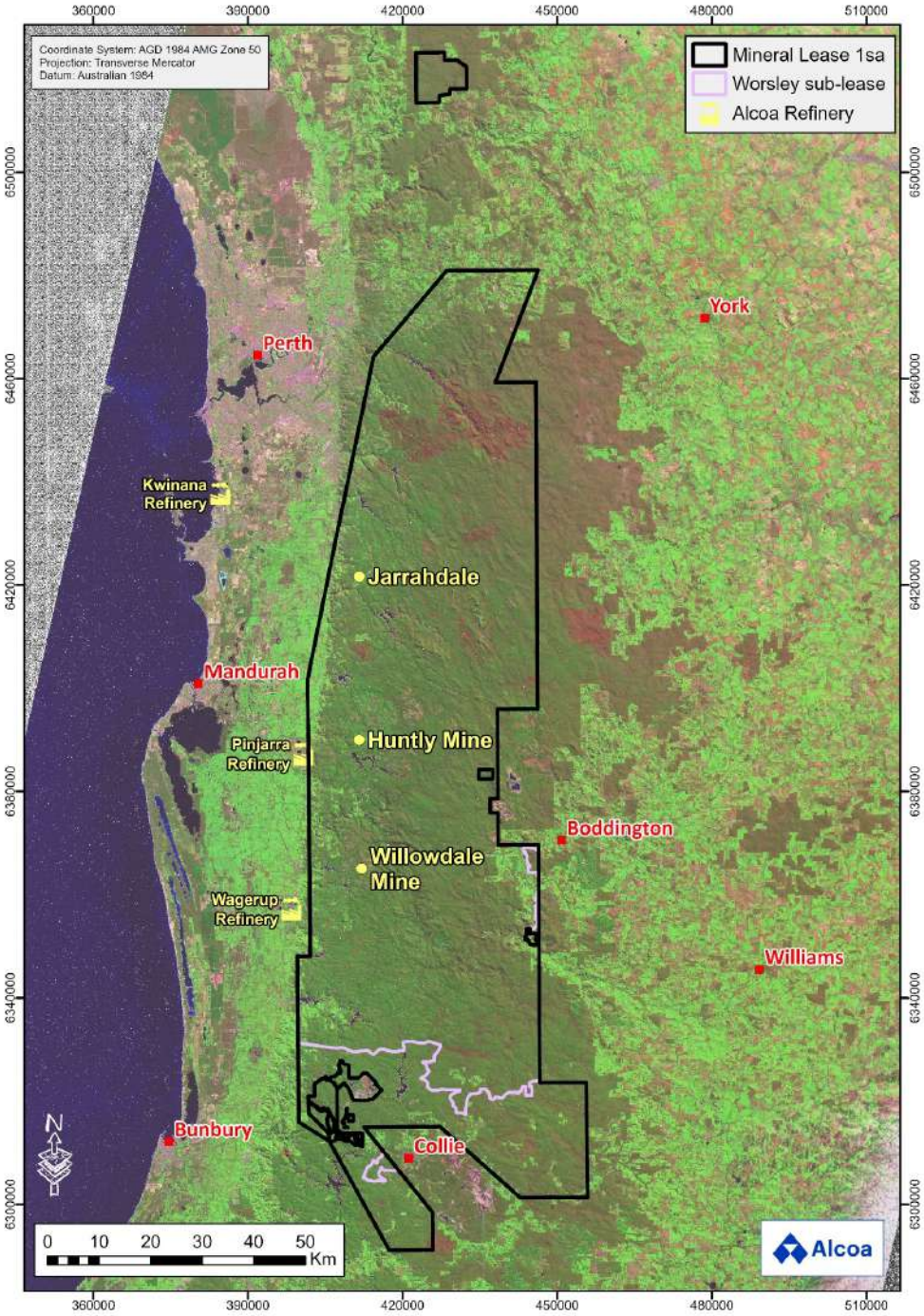


Figure 3-2: Map of Mining Reporting Centers, Mining Regions, and Production Sheets (Alcoa, 2024)

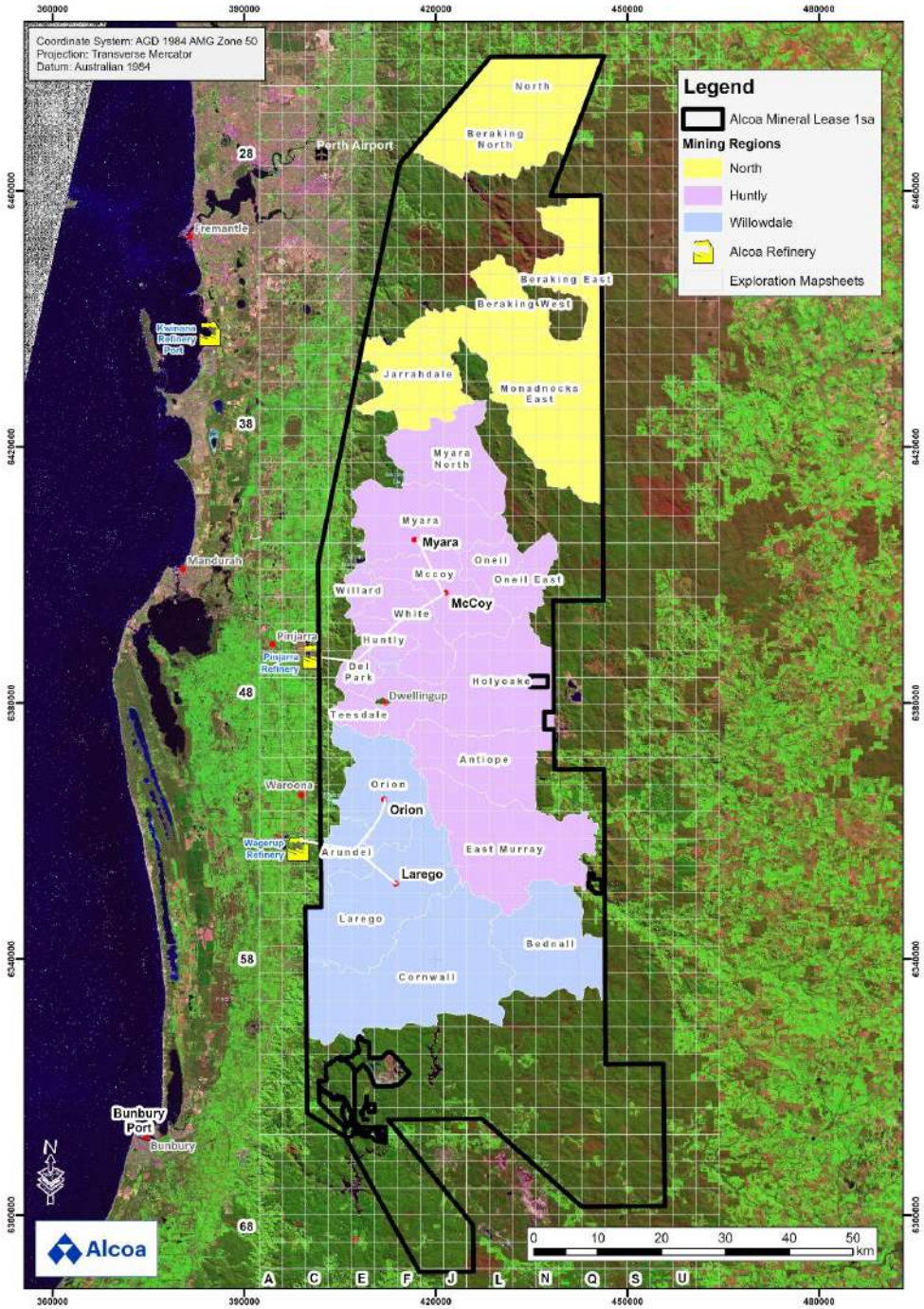
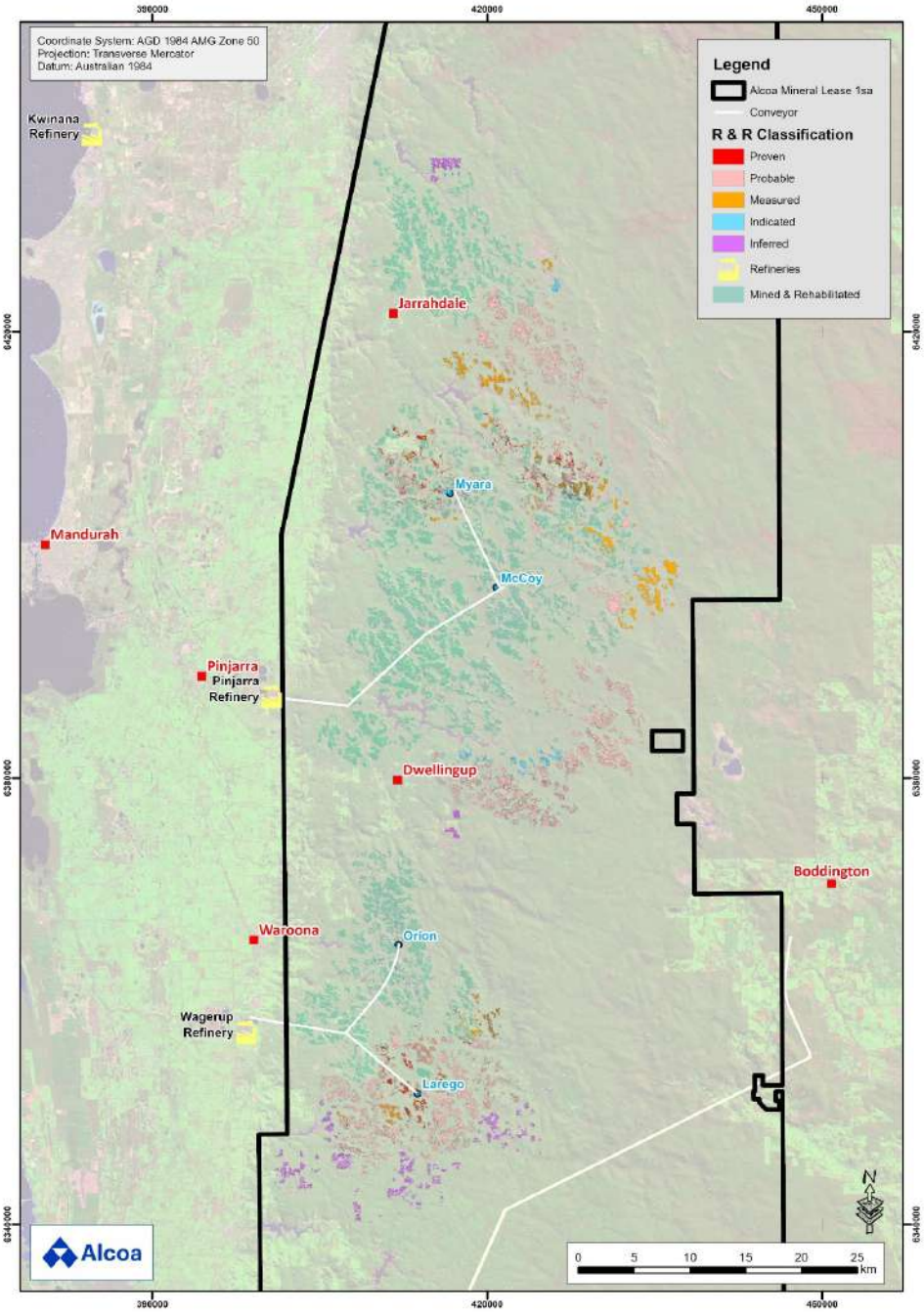


Figure 3-3: Map of Current Mineral Resource and Mineral Reserve Extents (Alcoa, 2024)



3.3 Naming Conventions

Alcoa has developed a terminology to refer to various parts of the Mineral Lease. There are three major Mining Reporting Centers in ML1SA: North (previously Jarrahdale), Huntly in the central area, and Willowdale in the south. The boundaries are nominal and may change to match the planned ore destination. The southernmost region of the North mining center was reallocated to Huntly in 2017 and named Myara North.

Mining Regions are subdivisions of the Reporting Centers that cover several years of mining activities, focused on a specific crusher location. The boundaries are named after forestry blocks. A total of 11 Mining Regions are represented in the current resource estimate: one in North, seven in Huntly, and three in Willowdale.

Mining Pits are named based on their sequence along haul roads. These names are used by the mining fleet when referring to local short-term production. The map reference system outlined below is used for drilling, estimation, and long-term planning.

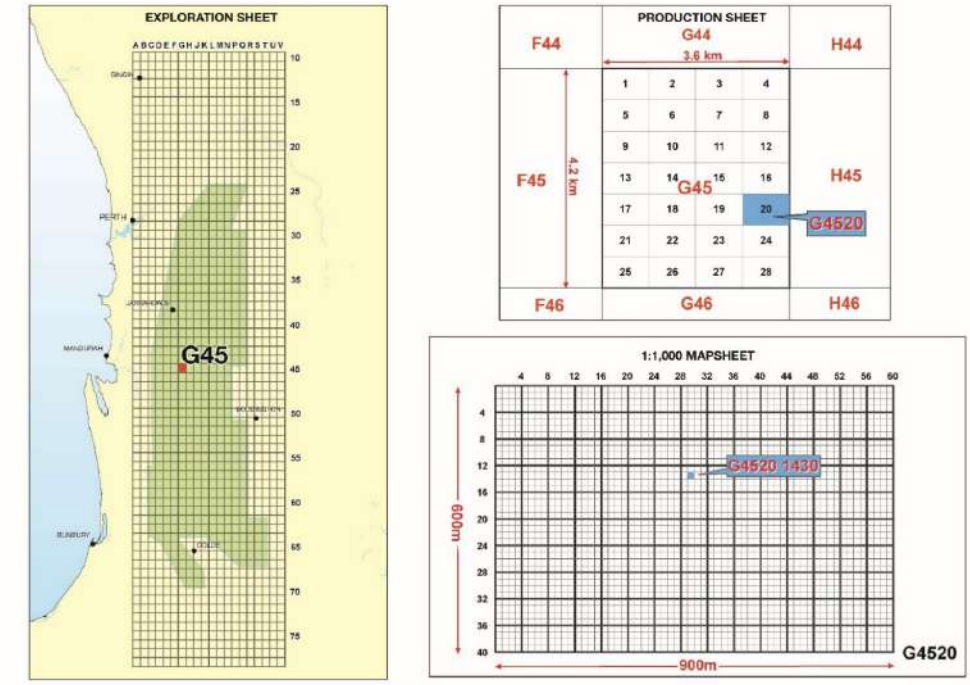
The Mineral Lease is divided into a grid of Exploration Sheets being rectangles 4.2 km (north) by 3.6 km (east). Each 15.12 km² Exploration Sheet is assigned a name and coded using letters A to V (west to east), and numbers 10 to 80 (north to south), e.g., G45.

Each Exploration Sheet is divided into 28 Production Sheets 900 m (east) by 600 m (north), an area of 0.54 km². The Production Sheets are assigned a number (1 to 28), sequentially 4 across (towards the east) and 7 down (towards the south), e.g., G4520.

Each Production Sheet is divided using a 15 m by 15 m grid resulting in 2,400 grid cells (40 north by 60 east). Each of these is regarded as a point and assigned a numeric code 1 to 40 towards the south and 1 to 60 towards the east. These are appended to the Production Sheet name to provide a grid point label, e.g., G4520 1430 and used on 1:1000 Map Sheets to define drill hole locations.

The Exploration Sheet, Production Sheet, and Map Sheet conventions are shown in Figure 3-4:

Figure 3-4: Exploration Sheet, Production Sheet, and Map Sheet Conventions (SRK, 2021)



3.4 Encumbrances

Baseline constraints on mining activities within the ML1SA concession are in place which prevent bauxite mining in these areas including (but not limited to):

- Within 200 m of the top water level margin of any water reservoir
- Within Serpentine Pipehead Dam Catchment
- National Parks
- Aboriginal Heritage Sites
- Old Growth Forest
- Formal Conservation Areas
- Within a 50 m buffer of Granite Outcrop (greater than 1 ha)
- The agreed Mining Avoidance Zones (MAZ) around the towns of Dwellingup and Jarrahdale.

Mineral Resources and Mineral Reserves have not been defined in these restricted areas. Operating rights are obtained by Alcoa through annual submission and approval of the Mining and Management Programs (MMPs) which include mining schedules and the authorizations provided by the Bauxite Strategic Executive Committee Bauxite (BSEC; previously the Mining and Management Program Liaison Group (MMPLG)).

Mining on a day-only basis is conducted in “noise zones” where noise from the mining operations will potentially exceed allowable levels. The operation actively seeks to maintain

lower noise levels than those mandated, thus mining in these areas is undertaken by contract miners on day shifts only.

3.5 Royalties

Alcoa is the holder of ML1SA. For bauxite that is mined and processed in Alcoa's Western Australian alumina refineries, Alcoa pays royalties on the alumina produced in accordance with the Alumina Refinery Agreement Act 1961 (WA).

3.6 Required Permits and Status

Alcoa operates under several State Agreement Acts as well as Ministerial Statements and environmental operating licenses issued under the Environmental Protection Act 1986 (WA) (EP) including:

- Alumina Refinery Agreement Act 1961 (WA);
- Alumina Refinery (Pinjarra) Agreement Act 1969 (WA);
- Alumina Refinery (Wagerup) Agreement Act and Acts Amendment Act 1978 (WA), which provided for the creation of the MMPLG (now BSEC);
- Alumina Refinery Agreements (Alcoa) Amendment Act 1987 (WA);
- Ministerial Statement 728 (as amended by Ministerial Statements 897, 1069 and 1157) (MS728);
- Ministerial Statement 646;
- Environmental Protection (Alcoa – Huntly and Willowdale Mine Sites) Exemption Order 2004 (Exemption Order);
- Environmental Protection (Darling Range Bauxite Mining Proposals) Exemption Order 2023
- Approved 2023-2027 Mining Management Plan (2023-27 MMP);
- Roll-over approval in October 2024 of the 2023-27 MMP (and conditions) now covers the time period of 2024-2028. While the conditions of both approvals are identical; the approval noted some temporal conditions of the 2023-2027 approval had expired, and that Alcoa had met some conditions prior to the roll-over approval;
- Environmental licenses L6210/1991/10 and L6465/1989/10 granted under Part V of the Environmental Protection Act 1986 (WA).

The MMPLG was first established in 1978 and is chaired by the Department of Jobs, Tourism, Science and Innovation (JTSI). It is now referred to as BSEC. Along with JTSI it is comprised of the following State Government agencies:

- Department of Biodiversity, Conservation and Attractions (DBCA)
- Department of Energy Mines, Industry Regulation and Safety (DEMIRS)
- Department of Planning, Lands and Heritage (DPLH)
- Department of Water and Environmental Regulation (DWER)
- Water Corporation (WC).

The MMPLG is recognized by the Minster for Environment in Ministerial Statements (95, 390, 564, 728, 897 and 1069) regarding expansion of Alcoa operations. The management and oversight of all Darling Range operations by the BSEC/MMPLG involves:

- Provide oversight to mining, infrastructure, processing and related operations within ML1SA;
- Advise on the environmental and social adherence of the 5-year MMPs developed by Alcoa on a recurring annual basis;
- Provide six-monthly authorizations for ground clearance for mining in accordance with the submitted and approved MMPs; and
- Provide oversight to ongoing rehabilitation of mined areas.

The permitting and approval processes, as provided by Alcoa, are summarized below:

- Clause 9 (1) of the 1961 State Agreement provides Alcoa the sole rights to explore and mine the bauxite deposits within ML1SA.
- Clause 5 of the Wagerup State Agreement specifies that Alcoa must consult with the DBCA in relation to the requirement to submit annual mine plans for mining associated with the Wagerup refinery.
- Under Clause 6 (1) of the Wagerup State Agreement, Alcoa has submitted several environmental review documents to the State Government for subsequent approvals of the Wagerup refinery construction and expansions. Within these environmental assessment documents, significant information on Alcoa's bauxite mining operations associated with the Wagerup refinery was included, resulting in several conditions in relation to Alcoa's bauxite mining operations associated with the Wagerup refinery being incorporated in the Ministerial Statements of which the current one is Ministerial Statement 728 (as amended). Procedure 3 of MS728 outlines Alcoa's requirements to have a publicly available Completion Criteria document for its bauxite mining operations, developed in consultation with the MMPLG/BSEC. Procedure 4 of MS728 outlines the MMPLG's/BSEC's authority to review and approve Alcoa's mining operations through the five-year Mine Plan process. To the extent the conditions on bauxite mining operations in Ministerial Statement 728 and the predecessor Ministerial Statements did not cover bauxite mining unrelated to the Wagerup refinery, Alcoa agreed to extend the conditions to the rest of its bauxite mining.
- Through the Wagerup State Agreement, MS728, and agreement between the State Government and Alcoa, the MMPLG/BSEC is responsible for reviewing and providing a recommendation to the Minister for State Development to approve Alcoa's five-year Mine Plans in concurrence with the Minister for the Environment and the Minister for Water.
- Alcoa's mining operations within ML1SA are also conducted in accordance with the Environmental Protection (Alcoa – Huntly and Willowdale Mine Sites) Exemption Order 2004 (Exemption Order) made by the Minister for the Environment. The Exemption Order is consistent with the Wagerup State Agreement that established the MMPLG/BSEC and MMP processes and it also reflects the procedures of MS728 that sets out the MMPLG's/BSEC's responsibility to review annual rolling 5-year mine plans for Alcoa's operations.
- The Exemption Order is in place while the EPA assessed the 2022-2026 and 2023-2027 MMP which were third party-referred to the EPA in February 2023.

Alcoa reports that all licenses and permissions for the current mining operations are valid, monthly and annual compliance reports submitted for review by SLR support this. On 28 February 2023, the Western Australian Forest Alliance Inc (WAFA) made two third-party referrals to the EPA under s. 38 of the EP Act. The referrals referenced Alcoa's Mining and Management Programs (MMPs) and its bauxite mining operations on the Darling Range in

the southwest of WA for the years 2022 to 2026 and 2023 to 2027. Following receipt of the referrals, the EPA sought further advice from Alcoa including detail on the scope of its planned/completed activities between 2022 to 2026 and 2023 to 2027. On 7 August 2023, EPA conducted a 7-day public comment on whether or not it should assess the proposals and, if so, what level of assessment is considered appropriate.

Section 38B of the EP Act provides that a proposal cannot be referred to the EPA more than once. In considering these referrals, the EPA undertook detailed investigations and enquiries to identify whether the proposals have been previously referred to the EPA.

Importantly, on 14 December 2023, the State Government announced the *Alcoa Transitional Approvals Framework* which enabled Alcoa to continue mining as defined in the 2023-2027 MMP (this approval was rolled over to 2024-28 in October 2024, with all conditions consistent with the 2023-27 approval) while the formal EPA EIA is in progress. In most circumstances, activities under assessment must cease during the EPA's process, however, the State Government granted Alcoa an exemption under section 6 of the EP Act to continue operating subject to a series of conditions. Note, that the State Government reserves the right to, with reasonable notice, withdraw or amend the exemption at any point. The Premier rolled over the 2023-2027 approval to cover 2024-2028 with the same conditions in October 2024.

On 18 December 2023, the EPA published its public advice in relation to the third-party referrals. The EPA concluded that five mine areas at Huntly (Myara North, Holyoake, White Road and portions of McCoy and Myara), and two at Willowdale (Mt William/Arundel/part Larego and Willowdale North/part Orion) have been previously referred. The remaining mine areas, the subject of the referrals, were found to be validly referred and that the likely environmental effects are significant warranting formal assessment at the level of public environmental review (10 weeks), the EPA's assessment numbers for the 2022-2026 MMP and 2023-2027 MMP are 2384 and 2385, respectively.

The EPA prepared a single Environmental Scoping Document (ESD) for both assessments across the first half of 2024, in consultation with Alcoa. The final ESD was published on 29 August 2024. The ESD outlines the basis on which the EPA will assess the MMPs for 2022-2026, and 2023-2027. The ESD acknowledges the short term duration of the Proposals, whereby authorisation to clear and implement the Proposals is sought for a time period not exceeding the years 2026 and 2027 (respectively).

In addition, as reported for 2022 and 2023, Alcoa is seeking formal environmental impact assessment and approval from the State and Federal Government to transition mining from the current Huntly mine area to Myara North and Holyoake, and to increase production at the Pinjarra refinery by 5%. The proposed transition in mining area and production increase has been determined by the EPA to be a significant amendment to an approved proposal. The proposed changes to Ministerial Statement 646 (MS 646) for the Pinjarra Refinery Efficiency Upgrade (PREU), approved in 2004 will be considered by the EPA in accordance with section 40AA of the EP Act; the PREU assessment is EPA's assessment number 2253.

The EPA acknowledges the unique relationships between assessments 2253, 2384 and 2385. 2384 and 2385 cover a shorter period of time and therefore focus on the avoidance of impacts in the execution of the MMPs up to 2027, whereas assessment 2253 is able to consider longer term mitigations across a wider area. Alcoa reports that all Environmental Review Documents for the three assessments are well progressed, and it is targeting publication in the first half of 2025.

3.7 Other Significant Factors and Risks

SLR is not aware of any environmental liabilities on the property. Alcoa has all the required permits to conduct the proposed work on the property. SLR is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the property.

4.0 Accessibility, Climate, Local Resources, Infrastructure and Physiography

4.1 Accessibility

As described in previous sections, the Darling Range Huntly and Willowdale operations are located approximately 150 km south of Perth. The Darling Range is readily accessible via road from Perth and surrounding areas. The mines are near the towns of Pinjarra and Waroona. Both towns are easily accessible via the national South Western Highway, a sealed single carriageway road, which starts on the southern side of Perth and continues for almost 400 km to the southwest corner of Western Australia.

Huntly is accessible from the South Western Highway via Del Park Road, a sealed single carriageway road which connects the town of North Dandalup in the north with Dwellingup in the south. From Del Park Road, a 3km sealed road following the route of the bauxite conveyor to the Pinjarra refinery provides access to the Huntly site administration offices.

Willowdale is similarly accessible 19 km from the South Western Highway via Willowdale Road, a sealed single carriageway road to the south of Waroona.

There are several airstrips in the region, although the closest major airport is in Perth, approximately 70 km north of North Dandalup. The nearest commercial port is at the curtailed Kwinana refinery, approximately 40 km south of Perth (as illustrated on Figure 15-1).

An extensive haul road network and overland conveyors transport crushed bauxite from the main mining hub to the Wagerup and Pinjarra refineries. Rail transport of bauxite to the curtailed Kwinana refinery (via the Kwinana freight railway system, using the Kwinana–Mundijong line) is also possible.

4.2 Climate

The southwest region of Western Australia exhibits a temperate climate, with very hot and dry summers (December to February) and mild winters (June to August). Rainfall is generally low and variable, ranging from an average rainfall of 25 mm during the three summer months and exceeding 200 mm during the three winter months (Australian Government, Bureau of Meteorology). Local climate conditions generally do not interrupt the mining schedule, which continues throughout the year. Occasionally however, significant rainfall inhibits access and can impact mining activities.

Table 4-1: Historical Climate Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
°C Mean Max	29.8	29.8	27.1	22.6	18.6	16.1	15.1	15.8	17.4	20.2	23.9	27.5
°C Mean Min	14.3	14.6	13.1	10.4	7.8	6.5	5.6	5.5	6.5	8.1	10.5	12.7
mm Mean Rainfall	16.4	21.4	26.7	65.5	155.0	231.0	234.0	192.0	129.0	78.1	45.2	20.2

Notes:

1. *Temperature and rainfall data sourced from the Australian Government Bureau of Meteorology, collected from the weather station at Dwellingup http://www.bom.gov.au/climate/averages/tables/cw_009538.shtml*
2. *Data includes that collected from 1935 to November 2024 (as available on 27 November 2024).*

4.3 Local Resources

The Darling Range is located in an easily accessible region of southwest Western Australia with the Huntly and Willowdale mining areas both within 15 km of well-established towns which act as residential and commercial centers. Several other towns and smaller settlements are positioned along the South Western Highway which acts as a major connection for the Darling Range to the city of Perth where a far greater range of general services is available.

4.4 Infrastructure

The following section refers to several named mining areas within the Huntly and Willowdale mining centers, including Myara, Larego, Orion, and Arundel, each of which is illustrated in

Figure 3-2 above.

Mining infrastructure in the Darling Range is generally concentrated in the Myara site in the northwest of the Huntly mining center, and at the Larego site in the center of the Willowdale mining area (20 km southeast of Wagerup). Both operations include various ancillary facilities that are not listed exhaustively here, however both infrastructure areas include:

- Ore crushing and handling facilities;
- Ore stockpile stacker/reclaimer;
- Maintenance facilities;
- Sampling stations;
- Site offices including a production tracking room;
- Haul road networks;
- Overland conveyors, as illustrated on Figure 15-1; and
- Water supplies consisting of abstraction from licensed surface water sources supplemented with treated wastewater from vehicle washdowns, stormwater runoff, and maintenance workshops. Water sources are illustrated on Figure 15-1.
    - The Huntly mine draws water from Banksiadale Dam and Boronia Waterhole. The mine also holds a license to draw water from Pig Swamp and Marrinup, although these are reported as being rarely utilized, and it is permitted to draw water from South Dandalup Dam under an agreement with the Water Corporation.
    - Willowdale Mine draws water from Samson Dam, approximately 10 km southeast of Waroona.

Personnel are sourced from the area around Perth, Western Australia, which benefits from a skilled workforce due to the relatively large number of operating mines in the region. Personnel typically have private accommodation in the nearby city of Mandurah (60 km from the mine) and towns (Waroona, Hamel, Yarloop, Harvey, and Wagerup).

Huntly Mine has three power supplies fed from the Pinjarra refinery. A single 33 kilovolt (KV) supply and two 13.8 kV supplies. The Pinjarra refinery is a net importer of power from the South West Interconnected System (SWIS), with internal generation capacity of 100 Megawatt (MW) from 4 steam driven turbine alternators. The steam is produced by gas fired boilers and a non-Alcoa gas turbine Heat Recovery Steam Generator (HRSG).

Willowdale Mine has a single 22 kV power supply fed from the Wagerup refinery. The Wagerup refinery is a net exporter of power to the SWIS, with internal generation capacity of 108 MW from three steam driven turbine alternators and one gas turbine. The steam is produced by gas fired boilers.

4.5 Physiography

The western edge of the Darling Range is characterized by scarps and incised valleys, landforms which are attributed to tectonic activity along the Darling Fault, the dominant structural feature in the region which acts as the western boundary of the deposits. This feature is observable in regional topographical survey information and satellite imagery to roughly follow the coastline of southwest Western Australia and is approximately demarcated by the extent of Jarrah Forest, a recognized bioregion.

The topography of the ML1SA concession generally comprises wide valleys and undulating hills separated by minor surface water drainage channels and streams. Vegetation across the ML1SA is dominated by several areas of State Forest including Dwellingup, Lane Poole, and Youraling. These include distinct areas of old growth forest within which mining is prohibited.

The typical elevation ranges from 300 m to 400 m in the mining areas, however the highest points of the region (outside of the mining areas) are approximately 550 m.

Topography data was acquired from:

- Drill hole collar survey data;
- Light Detecting and Ranging (LiDAR) surveys; and
- Landgate satellite data.

5.0 History

5.1 Prior Ownership

Prior to 1961, there were no records of ownership of the Darling Range mines. A Special Mineral Lease (ML1SA) was granted to Western Aluminum NL (WANL) in 1961. In the same year WANL joined Aluminum Company of America Ltd (Alcoa US). In 1977 WANL became Alcoa.

5.2 Exploration and Development History

The following text is sourced and modified from Hickman, *et al.*, 1992.

Bauxite occurrences were first recorded in the Darling Range in 1902. Bauxite was detected as a result of analyzing laterite from Wongan Hills, and subsequently through examination of lateritic road gravels from several localities in the Darling Range. The Geological Survey of Western Australia (Geological Survey) produced studies and publications, driving the bauxite exploration, though most attention was focused on localities in the Darling Range close either to Perth or to railway lines servicing towns such as Toodyay and York. The Geological Survey mapped the extent of laterite in the Darling Range (close to Perth) to determine whether it contained commercial deposits of iron or aluminum ore.

The earliest non-government exploration for bauxite was carried out in 1918 by the Electrolytic Zinc Co. of Australia Pty Ltd, deeming the deposits to be generally low grade and not of commercial value, though like earlier explorers, did not focus upon the underlying friable units.

Of 46 early samples of laterite analyzed in 1919, 26 contained 35% or more available alumina. It was then assumed that bauxite in the Darling Range was confined to the duricrust part of the profile, and not considered in the underlying friable units. By 1938 bauxite deposits were known to be common throughout the Darling Range over an area of 560 km long by 40 km to 80 km wide.

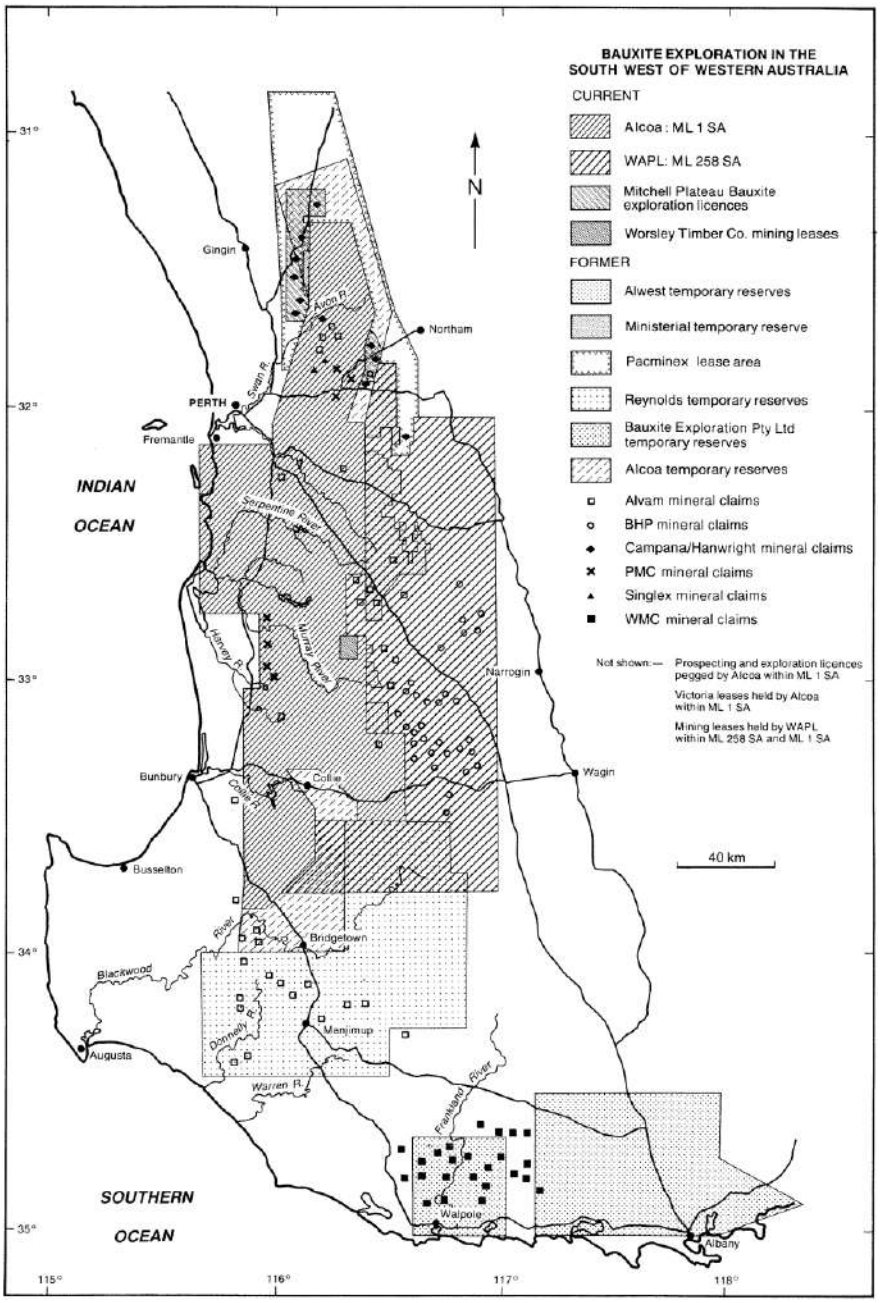
The Geological Survey maintained an interest in Darling Range laterite as an economic source of aluminum until the 1950s. However, by the late 1950s exploration had been taken over by mining companies.

No further private exploration took place until 1957 when Western Mining Corporation Ltd (WMC) began to explore for bauxite in the Darling Range. Following a regional reconnaissance, a joint venture company, WANL, formed by WMC with North Broken Hill Ltd and Broken Hill South Ltd, explored temporary reserves over a large portion of the southwest. Profiles were sampled from road cuttings, with samples collected at 400 m intervals along main roads. Selected lateritic ridges and plateaus were sampled at 90 m intervals. These areas were part of a Special Mineral Lease (ML1SA) granted to WANL in 1961.

By 1961, WANL had delineated 37 Mt of bauxite at an average grade of 33% AL. Also in 1961, WANL joined with the Alcoa US, allowing additional systematic exploration of lease ML1SA (Figure 5-1). Holes were drilled initially on 370 m by 185 m centers. Progressive in-fill drilling down to a spacing of 45 m by 45 m blocked out the ore at Jarrahdale and was followed by grade-control drilling. Commercial mining was finally started in 1963 at the former Jarrahdale mining center and continued until 1998, supplying bauxite to the Kwinana refinery.

In 1977 WANL became Alcoa. As of December 2024, the Huntly and Willowdale mining operations remain active. Huntly supplies bauxite to the Pinjarra refinery (approximately 17 million tonnes per annum, Mtpa) while Willowdale supplies the Wagerup refinery (approximately 10 Mtpa).

Figure 5-1: Bauxite Exploration in the Southwest of Western Australia 1961 (adapted from Hickman, 1992)



6.0 Geological Setting, Mineralization, and Deposit

6.1 Bauxite Deposits

Bauxite deposits, economic concentrations of aluminum oxide, represent the world's major source of aluminum and consist primarily of the minerals gibbsite, boehmite, and diaspore. These are commonly found alongside iron oxide minerals including goethite and hematite, kaolinite clay minerals, and minor accessory minerals.

Lateritic bauxite deposits such as those in the Darling Range of WA generally formed in tropical (hot and humid) environments through chemical weathering. As a result, lateritic bauxite deposits are known to exist across Central and South America, West Africa, Central Asia, and Australia.

With its large available resources, access to a stable workforce, infrastructure (comprising conveyors, rail, road, and port access), and three captive (mine-to-mill) dedicated alumina refineries, Alcoa's Darling Range Bauxite operations near Perth WA, has been one of the world's leading alumina producing regions for at least 30 years (Hickman *et al*, 1992), or approximately 60 years as of 2024.

6.2 Regional Geology

The bauxite deposits of the Huntly and Willowdale operations are located in the Darling Range region of southwest Western Australia. The predominant topographic feature of the region is the Darling Range Fault, a north-south trending scarp which extends approximately 220 km from Bindoon (70 km north-northeast of Perth) to Collie (160 km south-southeast of Perth).

The Darling Range Fault is the structural boundary between two geological terranes: the Pinjarra Orogen to the west, now the sedimentary Swan Coastal Plain, and the Yilgarn Craton to the east, a gneissic granite complex with greenstones. To the east of the Darling Range Fault intense weathering and erosion of exposed Archean basement rocks of the Western Gneiss Terrane, the western portion of the Yilgarn Craton, formed widespread lateritic bauxite deposits by the intense weathering, accumulation and leaching of the aluminosilicate rich material of the bedrock granites (Hickman *et al*, 1992).

Alcoa's current bauxite mining areas of Huntly and Willowdale are on the eastern side of the Darling Range Fault, as low-lying plateaus separated by valleys in which alluvial deposits have accumulated. Figure 6-1 shows the regional geology of the southwest region of Western Australia and Alcoa's ML1SA lease boundary in relation to Perth, while Figure 6-2 shows the distribution of surficial deposits across the region.

The Jarrahdale, Del Park, Huntly and Willowdale areas that have been mined by Alcoa are on laterite within the Western Gneiss Terrane (Figure 6-2), formed over granites that have been intruded by numerous north trending tholeiitic, quartz dolerite dykes, of early to late Proterozoic age, with thicknesses ranging from 1 m to 200 m.

Lateritic bauxite developed from the Late Cretaceous (65 million years ago, Ma) to the Eocene (40 Ma), with several periods of erosion and intense weathering of the basement granites and dolerites. Subsequent reactivation of the Darling Fault combined with periods of erosion led to the establishment of plateaus and incised valleys, trending to wider valleys and low hills to the east which now characterize the physiography of the region.

Figure 6-1: Regional Geology (adapted from SRK, 2021)

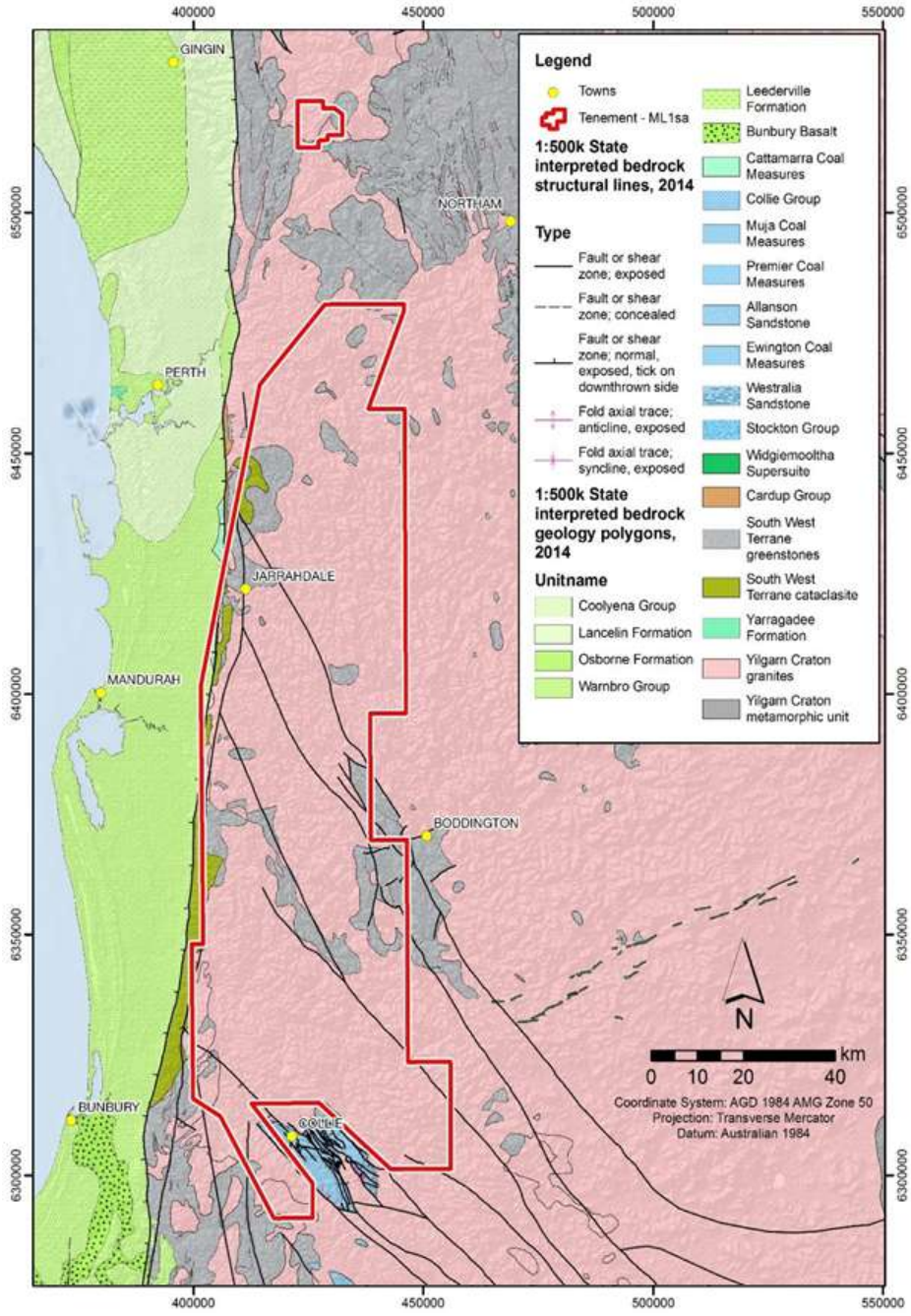
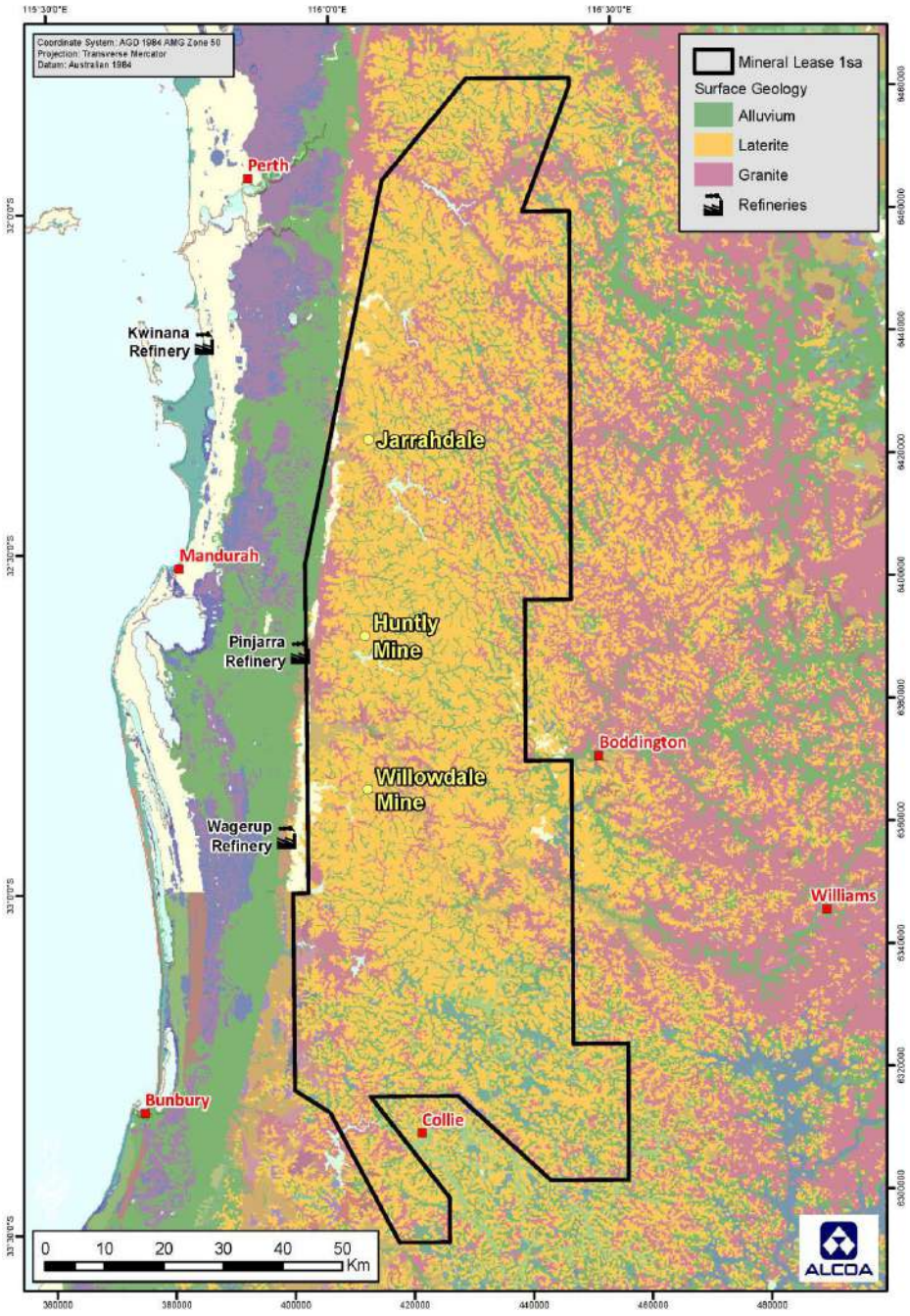


Figure 6-2: Surface Geology Showing Laterite Over Granite (Alcoa, 2015)

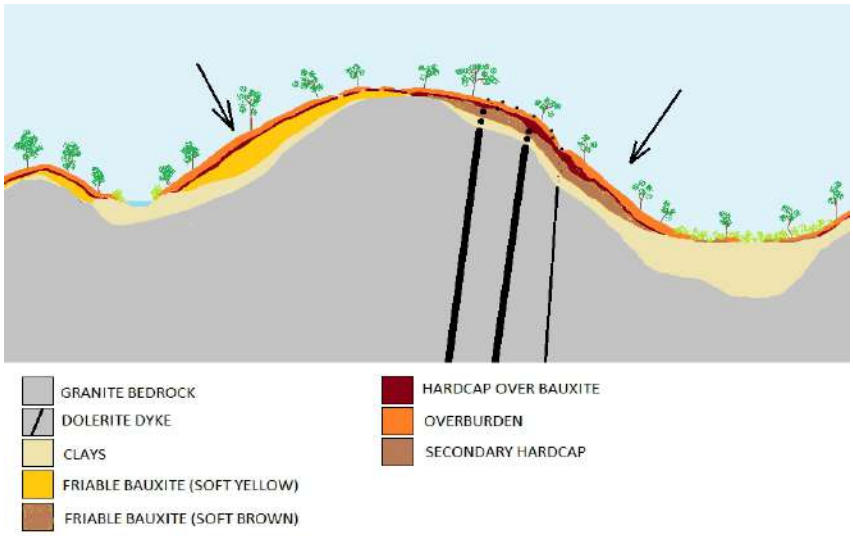


6.3 Local Geology

Laterite remnants are thickest and most extensive over a 150 km long region between the Avon and Harris Rivers, and within about 50 km of the Darling Scarp. The laterite occupies gently sloping (3° to horizontal) upland areas with an average elevation of 280 to 300 meters above sea level (MASL), and high annual rainfall. Steeper slopes may have a thin cover of partly transported laterite with bedrock near the surface. Above 340 m the laterite is penetrated by bedrock which rises above the general topographic level. Below 200 m drainage has removed pre-existing laterite. Blocks of laterite, released by headward erosion of streams, decay to lateritic gravels on the lower slopes of valleys, which pass laterally into alluvial sands and silt in the valley floors (Hickman *et al*, 1992).

Bauxite deposits typically occur as irregularly shaped lenses on the flanks of plateaus. Critical to this is the laterite position on the slopes (Figure 6-3): erosion generally dominates on steeper slopes which prevent accumulation and effective bauxite formation, whereas flat areas lack the necessary sub-surface water flows which drive the removal of clays and the enrichment of soluble silicate minerals.

Figure 6-3: Bauxite Deposit Formation Schematic – Relief Exaggerated (Alcoa, 2021)



6.4 Mineralization

Weathering, alteration and leaching of the granite bedrock has developed the bauxite mineralization which principally occurs as 65% microcrystalline gibbsite $Al(OH)_3$ with minor to rare boehmite $AlO(OH)$, and accessory minerals of 18% goethite $FeO(OH)$, 7% hematite Fe_2O_3, 9% quartz SiO_2, 1% kaolinite/halloysite $Al_2Si_2O_5(OH)_4$, and 0.5% anatase/rutile TiO_2.

Other minerals within the bauxite that may influence the alumina refinery performance include:

- Boehmite: generally occurring below 1%, this can cause premature precipitation of dissolved gibbsite resulting in alumina being lost to the red mud residues.
- Organic Carbon: as oxalate, typically less than 0.2%, (2.0 kg/t, measured as $Na_2C_2O_4$) this can result in reduced digestion efficiencies and cause crystal growth issues during precipitation.

- Sulphate: generally occurring at 0.25%, this can consume caustic soda during digestion resulting in lower yields.

6.5 Property Geology

Table 6-1 provides a summary of the typical stratigraphy defined by Alcoa across their Darling Range deposits. The Hardcap and Friable Zones represent the primary horizons of economic interest due to their concentrations of alumina. A generalized mineralogical profile through these horizons is provided in Figure 6-4 and a typical grade profile in Figure 6-5 showing the alumina and iron-rich Hardcap, with increasing silica and decreasing alumina through the Friable Zone.

Table 6-1: Alcoa's Darling Range Deposit Typical Stratigraphic Column

Stratigraphic Horizon	Typical Thickness Range (m)	Description
Overburden	0 to 0.5	Mixed soils and clays, high in organic matter, generally forming a thin layer which can penetrate deeper if the underlying Hardcap surface is variable.
Hardcap (Caprock)	1 to 3	Ferricrete formed by the remobilization of iron into a layer comprising iron and alumina-rich nodules which can exhibit the highest alumina concentrations across the deposit. Highly variable in thickness but generally 1 m to 3 m with a sharp contact against the underlying Friable Zone.
Friable Zone	3 to 5	Leached horizon resulting in the accumulation and enrichment of bauxite minerals. The Friable Zone comprises a mixture of the overlying Hardcap, clasts, Al and Fe rich nodules, and clays. Upper contact with the Hardcap is variable, found as a sharp or transitional boundary in places. AL typically reduces with depth as SI increases, defining the lower boundary with the Basal Clay.
Basal Clay	-	Kaolinitic clay horizon which transitions into a saprolitic zone above unweathered basement. This horizon is typically used as a marker indicating the full bauxite zone has been intersected and where drilling is often stopped.

Alcoa's bauxite deposits across the Darling Range show high variability in both the thickness and relative proportion of each horizon. Table 6-2 provides an extract from the acQuire database for the Mining Centres of Huntly (in the north) and Willowdale (more southerly) showing the most common (modal) Depth To Top and Thickness of the four stratigraphic horizons, based on logged drill holes from 2016 to 2020.

Table 6-2: Summary of Typical (Modal) Stratigraphic Horizons Within Each Area

Area	Description (m)	Overburden	Hardcap	Friable Zone	Basal Clay
Huntly	Depth to top	-	0.64	1.51	4.54
	Thickness	0.64	0.87	3.04	-
Willowdale	Depth to top	-	0.58	1.51	4.91
	Thickness	0.58	0.93	3.40	-
North	Depth to top	-	0.64	1.78	4.45
	Thickness	0.64	1.14	2.67	-

Figure 6-4: Typical Alcoa Darling Range Mineralogy Profile (Hickman et al, 1992)

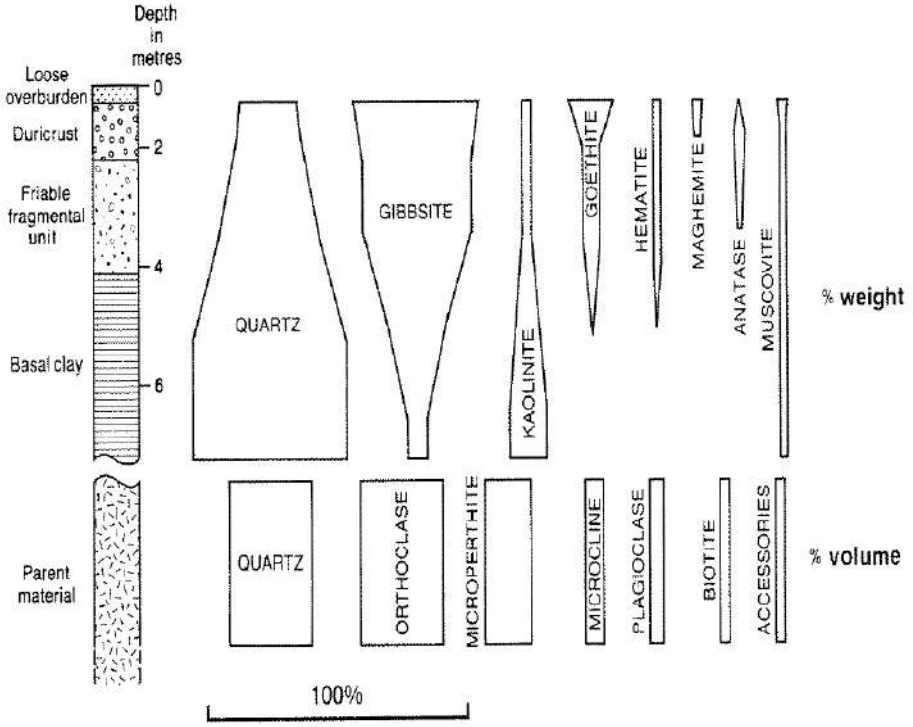


Figure 6-5: Typical Alcoa Darling Range Grade Profile (Alcoa, 2015)

Typical photos of the bauxite profile in current mining areas observed on 14 October 2021 are provided in Figure 6-6.

Figure 6-6: Typical Alcoa Darling Range Mining Sequence and Vertical Profile (SLR, 2021)

Vegetation cleared prior to mining

Top soil and oxalate removed leaving Hardcap

Blastholes on Hardcap after sheeting with low grade

Hardcap (hard brown) Friable (soft yellow), relict fresh remnant Dolerite dyke boulder

Sandy topsoil, Hardcap (hard brown), Friable (soft yellow), Basal Clay (white clay, lower right in the floor).

7.0 Exploration

7.1 Exploration

WANL, which became Alcoa (in 1977), carried out exploration over much of the ML1SA lease area in the 1960s as mentioned in Section 5.2. Samples were assayed for Total Al_2O_3 only and the data, referred to as the Imperial Drilling, is still retained comprising approximately 104,400 holes and approximately 670,000 samples.

The Imperial Drilling has not been used to prepare the current Mineral Resource estimate because the sample collection, preparation, and assaying techniques were not consistent with current practices and can no longer be validated.

7.2 Resource Definition Drilling

Resource definition drilling is initially done on a nominal regular grid spacing of 60 by 60 m. Infill drilling programs are then scheduled as required to reduce the drill spacing to 30 by 30 m, and then 15 by 15 m.

The planned drill hole collars are assigned a hole identifier (Hole ID) using the code of the 15 by 15 m grid point on the 1:1,000 Map Sheets (Section 3.3).

A total of 420,789 holes were used for the resource estimate, and these holes were drilled between 1981 to 2024, with approximately 83% drilled after 2009.

A tabulation of the drill quantities by year and location is presented in Table 7-1, and a graphical summary is shown in Figure 7-1.

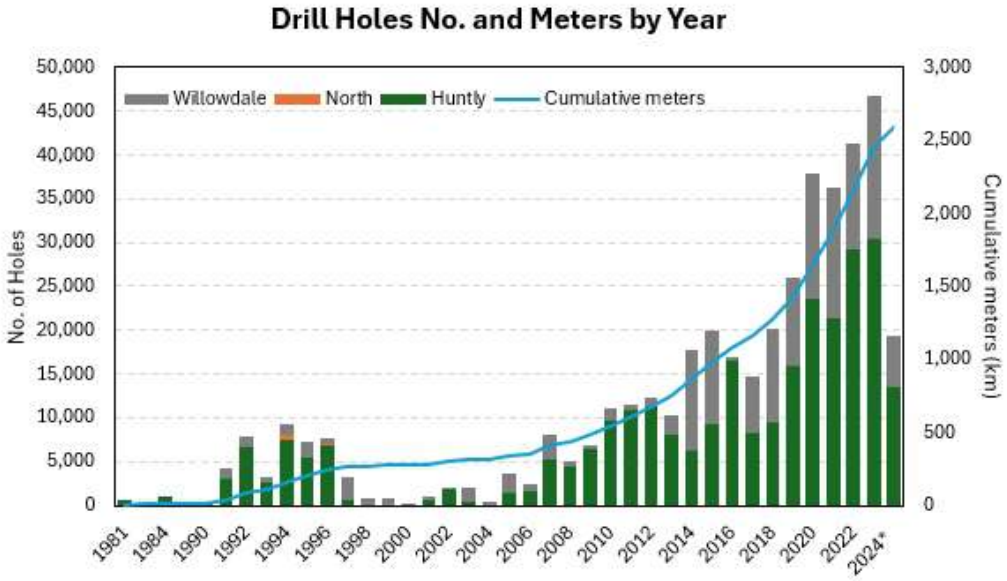
Table 7-1: Drill Quantities by Year and Location

Year	Holes				Meters				Assay			
	Huntly	North	Willowdale	Total	Huntly	North	Willowdale	Total	Huntly	North	Willowdale	Total
1981	656	---	---	656	5,574	---	---	5,574	10,415	---	---	10,415
1983	199	---	---	199	1,090	---	---	1,090	1,899	---	---	1,899
1984	995	---	---	995	7,083	---	---	7,083	12,119	---	---	12,119
1985	393	---	---	393	2,815	---	---	2,815	4,971	---	---	4,971
1990	13	---	---	13	58	---	---	58	101	---	---	101
1991	3,123	0	1,017	4,140	17,405	0	7,726	25,130	30,133	0	13,909	44,042
1992	6,669	0	1,153	7,822	37,561	0	8,399	45,960	65,048	0	15,234	80,282
1993	2,672	0	518	3,190	15,339	0	3,331	18,670	26,413	0	6,117	32,530
1994	7,380	632	1,168	9,180	41,092	4,019	6,453	51,563	69,785	7,103	11,224	88,112
1995	5,355	79	1,839	7,273	32,111	477	10,524	43,112	55,222	871	18,989	75,082
1996	6,777	336	634	7,747	37,195	1,522	3,998	42,715	63,627	2,667	7,256	73,550
1997	583	0	2,730	3,313	3,620	0	17,199	20,820	6,406	0	30,917	37,323
1998	12	0	830	842	162	0	5,119	5,281	307	0	9,289	9,596
1999	18	0	842	860	137	0	4,082	4,219	239	0	7,198	7,437
2000	22	0	174	196	187	0	1,022	1,210	344	0	1,852	2,196
2001	633	0	385	1,018	5,844	0	2,693	8,536	10,817	0	4,955	15,772
2002	1,818	0	247	2,065	16,135	0	1,417	17,552	29,624	0	2,515	32,139
2003	418	0	1,516	1,934	2,605	0	9,855	12,459	4,662	0	18,023	22,685
2004	0	0	389	389	0	0	2,000	2,000	0	0	3,603	3,603
2005	1,391	0	2,186	3,577	8,887	0	12,442	21,329	15,930	0	22,418	38,348
2006	1,652	0	736	2,388	11,809	0	4,561	16,370	21,749	0	8,396	30,145
2007	5,229	0	2,840	8,069	35,800	0	19,002	54,802	65,477	0	34,677	100,154

2008	4,371	0	739	5,110	25,955	0	4,524	30,478	45,654	0	8,101	53,755
2009	6,491	0	299	6,790	38,025	0	1,744	39,769	66,797	0	3,159	69,956
2010	9,776	0	1,220	10,996	57,679	0	8,540	66,219	100,163	0	15,718	115,881
2011	10,799	0	691	11,490	58,535	0	4,963	63,497	101,566	0	9,095	110,661
2012	11,270	0	1,127	12,397	62,056	0	8,767	70,824	107,576	0	16,251	123,827
2013	7,971	0	2,375	10,346	48,026	0	19,297	67,322	83,988	0	35,787	119,775
2014	6,297	0	11,429	17,726	33,616	0	80,252	113,869	58,175	0	147,213	205,388
2015	9,243	0	10,789	20,032	51,370	0	66,228	117,598	89,750	0	120,696	210,446
2016	16,512	0	443	16,955	96,102	0	2,373	98,474	168,325	0	4,268	172,593
2017	8,265	0	6,363	14,628	44,296	0	37,777	82,073	76,690	0	67,290	143,980
2018	9,476	0	10,768	20,244	52,689	0	56,673	109,362	92,887	0	99,811	192,698
2019	15,923	0	10,138	26,061	91,912	0	67,348	159,259	162,134	0	121,383	283,517
2020	23,570	0	14,292	37,862	124,981	0	91,537	216,518	217,667	0	165,080	382,747
2021	21,347	0	15,002	36,349	131,600	0	114,280	245,880	231,155	0	207,367	438,522
2022	29,231	0	12,165	41,396	179,487	0	88,487	267,974	318,537	0	160,277	478,814
2023	30,494	0	16,230	46,724	183,141	0	119,708	302,848	318,665	0	220,275	538,940
2024*	13,419	0	6,005	19,424	84,457	0	45,311	129,768	147,413	0	83,504	230,917
Total	280,463	1,047	139,279	420,789	1,646,435	6,018	937,628	2,590,081	2,882,430	10,641	1,701,847	4,594,917

** Drill holes completed until June 30, 2024.*

Figure 7-1: Chart of Resource Drill Holes by Year



The Darling Range deposits contain more than three million drillholes distributed across a lease of over 7,000 km², making it unfeasible to show a plan view of the property with the locations of all drill holes and other samples. Figure 3-3, however, shows the lateral extent of Alcoa's mined areas and Mineral Resources and Mineral Reserves within the ML1SA lease.

The Darling Range bauxite project is considered to be in the process of sustaining Mineral Reserve from already defined mineralization, rather than in Exploration mode, looking for new, broader targets. Resource Definition drilling is planned to continue throughout all areas where Alcoa has mining permits as described, to sustain the Mineral Reserves and future production.

7.3 Drilling Methods

The methods currently used for drill sampling in the Darling Range by Alcoa have been consistently used since the 1980s. Drilling is done using dedicated drills mounted on a fleet of tractors which can be driven off tracks into the forest, causing minimal damage or disturbance and obviating the need to clear drilling pads. Planned hole positions are located by the driller using Global Positioning System (GPS). The articulated tractors are highly maneuverable and there is only minor disruption to groundcover vegetation and saplings which may be eased out of the way (Figure 7-2).

Figure 7-2: Resource Drilling Tractor Accessing the Forest (SLR, 2021)

Drilling is completed by Alcoa using vacuum drill rigs, by contractor Wallis Drilling using their patented reverse circulation (RC) aircore rigs, and by contractor JSW using a similar RC method. Wallis and JSW holes are both referred to as aircore drilling.

In recent years the drilling period has been extended from 9 to 10 months. More wet ground is now encountered and, where required, vacuum drilling is either deferred until the ground conditions improve, or is re-assigned for aircore drilling.

Drilling is rapid with holes typically completed every 15 minutes from locating the collar position to completing the drilling, cleaning the sampling equipment and readying the samples for dispatch. While 12 rigs are currently used, the procedure is consistent across all rigs and virtually unchanged since the early 1990s at Jarrahdale. Minor modifications to the drilling procedures that have occurred include (in order of importance for their impact on the resource database):

- Drilling initially was done by vacuum rigs but this has been supplemented by the aircore rigs.
- GPS methods have been introduced to locate the drill hole collar positions in 3D space, providing more precision on the hole and sample locations.
- The sample catching, splitting and logging procedures have been progressively upgraded, following review by various independent consultants (Holmes, 2018; Snowden, 2015; SRK, 2017, 2018, 2019b, 2021a; Xstract, 2016). The riffle splitting system has been enhanced through simple changes to provide a better, more robust method.
- The logging system has changed from manual paper plods to a completely digital recording system, albeit with paper backup where needed. Barcodes are now used on samples and matching these to the logs is now semi-automatic.
- The splitting and logging equipment on the drill rig has been progressively improved to make setup and pack-down more efficient and to protect the logging equipment during site moves.
- Rollover bars, guards, shields, lockouts and other safety protections have been added, and safety procedures have been enhanced with industry norms.
- Environmental protections and reporting have been enhanced to best practice in SLR’s opinion.

Samples used for Mineral Resource estimation are only acquired using vacuum drilling or aircore reverse circulation. Both methods generally drill dry holes in that water is not added. Water ingress into vacuum holes destroys the sample circulation and wet holes are abandoned. Alcoa commenced aircore drilling in 2015, with the initial plan being to phase out vacuum drilling. The prime advantage of aircore over vacuum is sample recovery when holes do encounter groundwater.

In vacuum drilling the sample is finely ground and sucked up from the bottom of the hole by a top-mounted vacuum pump. In aircore drilling, compressed air is blown down the annulus between the inner and outer drill string tubes, pushed out through ports on the face of the bit and then blows the sample through the center of the bit and up the drill string.

In both methods, the sample material is extracted from inside the bit, avoiding sample delineation error (contamination), and carried up the center of the drill string into the sampling container, avoiding sample extraction error (sample material left down the hole or lost as dust).

The aircore drilling uses a blade bit with a nominal cutting diameter of 45 mm and an internal retrieval tube diameter of 22 mm (Figure 7-3). Alcoa increased the internal diameter to 25 mm in 2018 to reduce blockages. The particle size of drilled material is sufficiently small (less than 10 mm) to promote good sample splitting in dry conditions.

Figure 7-3: Drill Bits, Reverse Circulation Drill String and Particle Size of the Sample Residue (SLR, 2021)

Scale pen diameter 13 mm

7.4 Drill Sampling

7.4.1 Procedure

The sample catching, splitting, and logging procedures are the same for both vacuum and aircore drilling (Figure 7-4).

The drilling and logging are controlled by the driller with minimal supervision by geologists. This has been observed and is deemed reasonable by the QP due to the combination of very simple logging, experienced personnel, employment continuity and continual review by geologists.

Sampling begins at the base of the overburden and continues until the driller considers that the basal clays have been penetrated for at least 1 m or for infill holes at a 15 m spacing to the depth defined on the drill hole plan from surrounding data. The depth of basal clays to be penetrated was increased to 2m in 2019 for 60m spaced holes and in 2021 for 30m spaced holes. Alcoa estimates that, most recently, less than 5% of the limited depth holes terminate in bauxite.

Samples are collected at 0.5 m intervals, measured using a laser gauge mounted on the rig. At the end of each 0.5 m interval, the drilling is paused and the sample passes from the cyclone (for aircore) into the collection flask. For vacuum drilling the collection flask is at the end of the vacuum system.

The sample, nominally 1.5 kg, is poured from the flask into a feed tray, distributed evenly, then on the vacuum rigs the tray is pivoted to feed a small 12-vane riffle splitter (the rotating tray is excellent but not yet fitted to the aircore rigs). Where (usually) required, the splitting is repeated to give a retained split of 150 to 200 g, small enough to be collected into a 120 mL measuring cup with minimal spillage. The riffle split subsample is poured into a barcoded Kraft packet and boxed for dispatch to the assay laboratory. The sample retrieval and splitting systems are cleaned with compressed air after each hole.

During the site inspection, the JSW RC sampling procedures were observed closely. It was found that the principles of correct sampling were understood by all personnel at the rig and the equipment and practices were observed to be satisfactory.

Over the period 2015 to 2021 the drill sampling procedures have been externally reviewed (Snowden, 2015; Holmes, 2018; and others) and various improvements have been made such as using riffle splitters with more vanes, using a pivoting tray to consistently feed the splitter, training in the correct splitting and retention of all the subsample, digital recording of logging, monitoring of accuracy with Standards, and monitoring of precision with duplicates.

SLR opinion on the drilling, sampling, and recovery factors are discussed in Sections 8.5 and 11.17.

Figure 7-4: Sample Catching and Riffle Splitting Practices (SLR, 2021)

7.4.2 Recording Sampling Data

The drill hole and sample information are recorded digitally onto a tablet at the rig during drilling (Figure 7-5). The data is automatically loaded into an acQuire database. In previous years the same information was all recorded in a ticket book and manually transferred to the database.

This approach remains as a backup method when needed. Data recorded includes hole number, drill rig number, driller name, offsider name, depth of overburden, depth of Caprock, map reference, material type code, and comments on the reason for ending the hole, e.g. if bedrock or water was encountered.

Figure 7-5: Barcode Reader and Digital Recorder Mounted on the Drill Rig (SLR, 2021)

7.4.3 Sample Logging

The geology of the Darling Range bauxite is well understood. The Material Type codes have been simplified to meet the production needs of the operation and the drill crew has been trained in their identification, which is primarily based on color and hardness.

This results in logging of a reasonably consistent regolith profile formed by surface weathering of the few bedrock types (granite or dolerite). A comprehensive geological log is not produced but the Material Type codes can be ratified by the assay results. The Material Type codes are provided in Table 7-2.

Table 7-2: Logging Codes for Material Type

Material Type	Description	Comment
HB	Hard brown	Hardcap and Friable Zone
HSB	Hard / soft brown	
SB	Soft brown	
SY	Soft yellow	
CLB	Clayish brown	
CLY	Clayish yellow	Basal Clay Zone
BC	Brown clay	
YC	Yellow clay	
WC	White clay	
DOL	Dolerite	Intrusion
GR	Granite	
WET	Wet	Other
ROD	Broken rod	

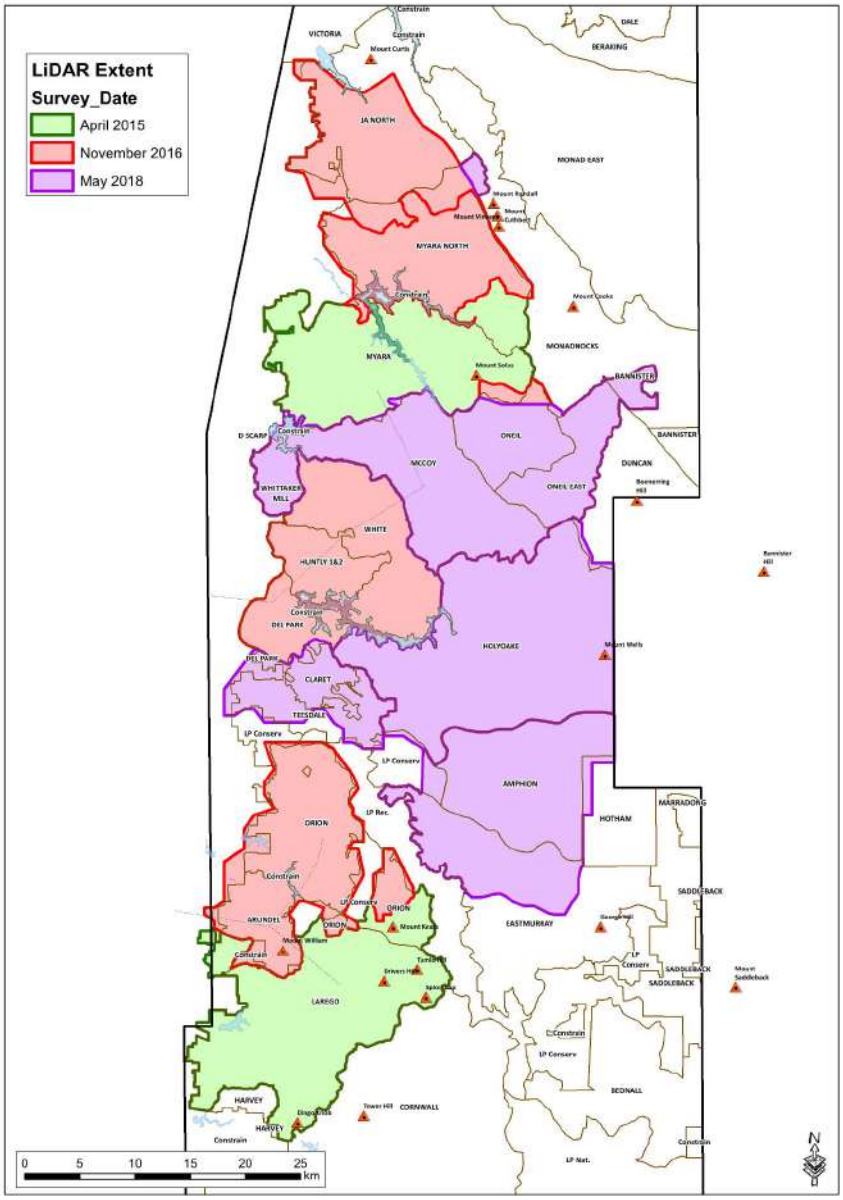
7.5 Topography

Topography data was acquired from:

- Drill hole collar survey data and check surveys performed using Trimble R10 real time kinematic differential global positioning system (RTK DGPS) equipment.
- LiDAR surveys conducted in April 2015, November 2016, and June 2018 (no further surveys have been required). A plan showing the LiDAR coverage for each survey is provided in Figure 7-6.
- Landgate satellite data collected in the late 1990s.

A digital elevation model representing the natural surface was prepared by combining (in order of priority) the collar survey data, the LiDAR data, and the satellite data.

Figure 7-6: Topographic Data Coverage of the 2015, 2016 and 2018 LiDAR Surveys (Alcoa, 2022)



7.6 Surveying

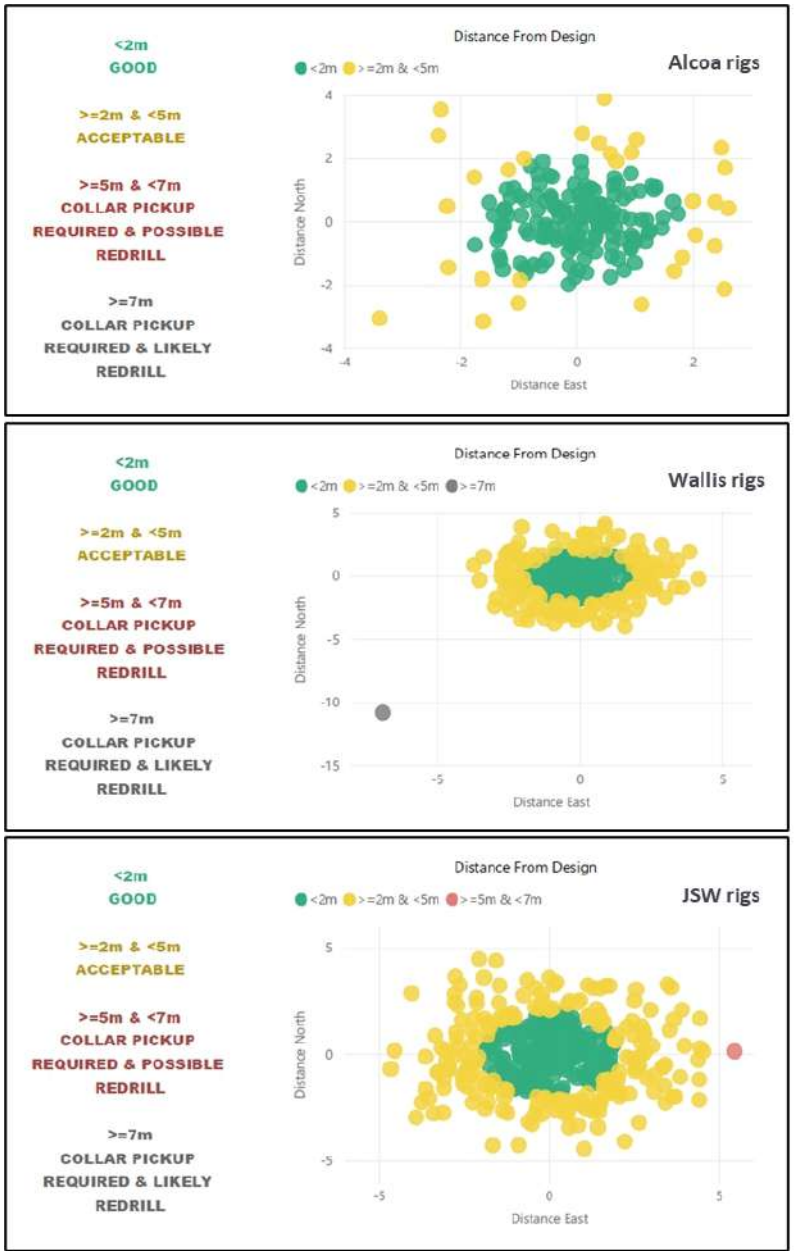
Alcoa has consistently drilled the Darling Range bauxite deposit on a 60 by 60 m grid (with infills to 30 by 30 m and 15 by 15 m) since the 1970s. Initially collar peg positions were surveyed using either a theodolite or Total Station. The 30 m and 15 m pegs were positioned between the 60 m pegs using tape and an optical square. Alcoa commenced using GPS survey control (RTK DGPS) in mid-2015.

Drilling is conducted before any forest clearing activities, which are only carried out for mine development. Positioning the drill rigs is thus imperfect. If the actual coordinates are within 2 m of the planned coordinates, the hole is considered to be correctly located, and the planned coordinates are used in all subsequent processing. Holes that are collared more than 2 m away from the planned location are flagged accordingly in the database, but the planned coordinates are still used in preference to the actual locations. In 2015, Alcoa commenced check surveying of collar positions after drilling. Most of the holes drilled in 2016 and 2017 were check surveyed. Major discrepancies, such as large differences between the actual coordinates and the coordinates defined by the hole identifier, are investigated and corrected in the database.

The planned coordinates at the 15 by 15 m grid points on Map Sheets (see Section 3.3) were used in preference to the actual coordinates. This choice stems from the fact that the original resource delineation systems (Polygonal and GSM, see Section 11.4) were based on the use of regularly gridded data. However, the current 3DBM methodology prioritizes the use of actual coordinates. The use of planned instead of actual coordinates does introduce some uncertainty in the local sample position and consequently the local estimates. However, it is noted that:

- The lateral error is random, small in magnitude compared to the smallest drill grid spacing (15 m) and monitored (Figure 7-7) with deviations from plan greater than 7 m redrilled.
- The error affects few holes (for example, in 2022/23 of the 60,754 holes drilled, 58% were within 2 m, and 99.8% within 5 m).
- The long range of the grade continuity of mineralization as shown by the variograms is several hundred meters.
- The local small-scale variations on the grade of mineralization due to variations in the amount of lateralization are uncontrolled and unpredictable (see discussions of drill hole twinning in Section 8.4.4.3).
- The effect is a controlled ‘random stratified grid’, given that the nominal collar position is always used for estimation and there is no evident bias.

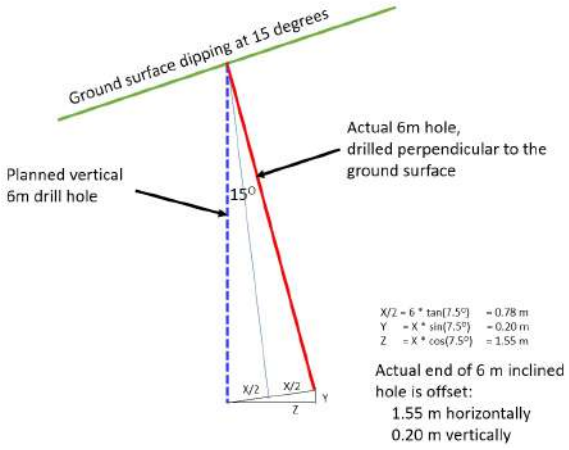
Figure 7-7: Error in Actual Collar Location from the Nominal (planned) Position is Monitored for the Three Drill Rig Types (Alcoa, 2021)



Downhole surveys are not performed in drill holes because of their generally shallow depth and narrow diameter, so all holes are assumed to be vertical.

The drill rigs have limited capacity to be levelled and cannot drill angled holes, so in some circumstances the holes may be drilled perpendicular to the natural surface. The rigs are designed to safely operate on gradients of up to 15°, so holes could be drilled up to 15° off the vertical. For a 6 m hole drilled at the planned collar position, the offset may be up to 1.55 m horizontally and 0.2 m vertically (Figure 7-8).

Figure 7-8: Possible Lateral and Vertical Sample Location Error on 15° Sloping Ground (SLR, 2021)



The impact of differences between the actual locations of samples in 3D space compared to their nominal location on the mine plan is considered to not materially impact the Mineral Resource because the errors in the spatial controls on mining are likely to be of the same magnitude as the spatial errors in mining (±2 m laterally and ±0.3 m vertically). Mining is locally controlled by DGPS on mining equipment to meet short-term plans and visually for indications of the base of ore (e.g., WC white clay).

7.7 Sampling Conclusions

In the QP's opinion, the drill sampling and sample control procedures at Alcoa's Darling Range Bauxite Operations are adequate and appropriate for use in the estimation of Mineral Resources. The defined volumes and grades of mineralization are not expected to be systematically impacted (biased) by errors in either the collar location or the 3D sample location.

7.8 Hydrogeology Data

Historically, no site-specific hydrogeological data was available on the basis that no hydrogeological considerations are required for the definition of mining plans in Alcoa's Darling Range operations. However, extension of mining activities into the proposed Myara North and Holyoake development envelopes was recently considered to potentially pose a risk to the multiple uses of groundwater in the area including drinking water production, timber harvesting, pine plantation and recreation.

Alcoa has collected groundwater level and groundwater quality data within the Myara North mine region since the 1970s, with available groundwater data typically concentrated within the eastern areas of the mine region. In contrast, only limited water level and water quality data had

been obtained within the Holyoake mine area. As part of the 2020 to 2021 baseline monitoring program, the monitoring network and program was expanded to include:

- 18 new groundwater bores at 16 locations within the Myara North mine region, to supplement 25 existing Alcoa groundwater bores. Two sites included installation of a shallow and deep paired bores, providing data on groundwater for the upper 'perched' unit and the underlying more regional groundwater.
- 17 new groundwater monitoring bores were installed in 2020 within the Holyoake mine region, to supplement 8 existing Alcoa groundwater bores.
- The baseline groundwater monitoring program comprised monthly water level dips and physico-chemical parameter measurements from October 2020, with groundwater samples collected for laboratory analysis of a broader suite of parameters in October 2020 and February 2021.

In consideration of the data obtained from the expanded monitoring network, several hydrogeologic and hydrologic investigations were undertaken by GHD Pty Ltd (GHD) throughout 2021 and into 2022, including:

- Implementation of a baseline surface and groundwater monitoring program including installation of a monitoring network
- Groundwater modelling for Myara North and Holyoake mine regions
- Drinking water risk assessment for Serpentine, Serpentine Pipehead, South Dandalup and Wungong Brook catchments.

The results of these investigations will be assessed as part of the Pinjarra Alumina Refinery Revised Proposal (Assessment No. 2253), which includes the Huntly Bauxite Mine transition to Myara North and Holyoake (See Section 17.1.2).

The work completed by GHD has been incorporated into Alcoa's Catchment Risk Assessment (CRA). The CRA considers potential hazards to PDWSAs and other factors to evaluate mining related catchment risk. This is an iterative process that will allow refining of the model to ensure it is more accurate on the completion of each subsequent iteration. Iteration 1 was produced in 2022; it will be revised in consultation with DWER, DBCA and other relevant regulators. While the CRA is designed to inform mining risk (and lack of risk) the data and predictions can be applied to exploration. Ultimately, the CRA will help Alcoa understand in more detail the hydrological and hydrogeological risk down to a subcatchment level, supporting the development of future mining areas. The CRA is an integral part of the approved 2023-2027 MMP, and the roll-over approval of 2024-2028.

7.9 Geotechnical Data

As the slopes are so shallow, no geotechnical considerations are required for the definition of mining plans in Alcoa's Darling Range operations.

Some limited material characterization is available within the historic reports carried out for the ROM and bauxite crushing facility and seven other mine infrastructure locations. The crusher site is situated south of Willowdale though the geology is considered similar across the sites. Testing includes cone penetration (CPT), basic laboratory classification, some limited consolidated undrained (Cu) triaxials and point load testing (PLT). Some historical data is available for strength testing within the caprock unit including unconfined compressive strength (UCS), young's modulus (E), tensile strength and abrasion. A factual laboratory report is

available from Wirtgen group based off six rock samples (post drilled from cobbles) taken at Huntly with testing including UCS, tensile strength and Cerchar abrasivity. Details for the testing protocols/standards for the Wirtgen tests are not available. As such, it is considered that there is limited information available in terms of material characterization, strength testing, or pit wall design for the mine site.

Recent factual and interpretive results of a geotechnical investigation carried out by Tetra Tech Coffey Pty Ltd (TTC) in July 2023 for the Kisler Stage 1 area are available. Laboratory testing was carried under TTC direction by STATS Australia, a National Association of Testing Authorities (NATA) accredited laboratory located in Canning Vale WA, in accordance with the general requirements of Australian Standard AS1289. A NATA accreditation is to the ISO/IEC 17025 standard, which demonstrates that the laboratory operates competently and generates valid results. TTC states that the geotechnical laboratory assessment was conducted on representative soil and rock samples recovered from test pits and boreholes, with laboratory test certificates available. The investigations were carried out primarily within the footprint of the proposed Kisler facility, located approximately 10 km south-east of the Serpentine Main Dam. The generalized subsurface profile of the site is presented in Table 7-3, with the assumption that the actual interface between materials may be far more gradual or abrupt than those made based on the facts obtained. An additional assumption is made in that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area.

Groundwater was not encountered at any of the test pit locations, to the maximum depth of investigation (i.e. 3.3m BGL). Groundwater was not observable at the borehole locations due to the use of drilling fluid. However, all boreholes have been converted to monitoring bores for future groundwater monitoring purposes.

Based on the results of geotechnical investigation and AS 1170.4 – 2007 Structural Design Actions (Part 4: Earthquake actions in Australia), a sub-soil classification of “Class Ce – Shallow soil” is considered appropriate for the Kisler Stage 1 site at the time of investigation by TTC.

Table 7-3: Generalized subsurface profile

Layer/Unit	Typical Depth to Top of Layer (m)	Typical Layer Thickness (m)	Description/Remarks
Sandy Silt / Silty Sand / Sandy Clay / Clayey Sand	0.2 – 3.0	1.2 – To maximum depth of investigation	Low to medium plasticity, yellow-brown to brown, sand, fine grained, sub-angular, with some gravel. Predominantly encountered at most test locations throughout the course of investigation.
Clay	0.00 – 11.0	3.0 – 5.4	Medium to high plasticity, brown, yellow-brown, grey-brown, with some sand and gravel.
Silty Gravel / Clayey Gravel	0.0 – 9.0	3.0 – 5.0	Fine to coarse grained, sub-rounded and sub- angular, grey-brown and brown, clay, low to medium plasticity, with some sand, trace non-plastic fine.
Granite / Dolerite	5.60 – 20.00	To maximum depth of investigation	Medium to coarse grained, pale grey to grey, red- brown, generally very high to extremely high strength. Some boreholes showed very low to medium strength.

			Granite was encountered at most borehole locations. Generally high to extremely high strength. Dolerite was encountered at 1 location. Extremely high strength.

8.0 Sample Preparation, Analyses, and Security

Sample preparation is performed by Bella Analytical Systems (Bella). Although the laboratory is located within Alcoa's curtailed Kwinana Refinery complex and only processes Alcoa material, it is independently owned and operated by Bella. A link exists between the Bella and Alcoa Laboratory Information Management System (LIMS) for the two-way exchange of data. Bella does not have Australian National Association of Testing Authorities (NATA) accreditation.

All assays produced by Bella are monitored and controlled by Alcoa at the Kwinana Mining Laboratory (KWI), which, although it has a QA/QC system based on ISO 9001 protocols, only has one section of the laboratory certified to ISO 9001 for the purpose of certification of shipment assays of alumina.

A robotic processing system is used to prepare each sample for Fourier Transform Infrared Spectrometry (FTIR) and Reference Method (REF) testing. This entails pulverizing each sample in a flow-through ring mill to a nominal grind size of 85% passing 180 µm, and then splitting off sufficient material to fill a barcoded scanning flask (20 mm high with an 80 mm diameter). The material from the ring mill is discharged through a rotary splitter, with approximately 80–100 g of material retained for geochemical testing, and the remainder discarded. A duplicate sample is collected from 1% of the samples via a rotary splitter fitted with twin select chutes. These samples are used for Reference Methods testing.

8.1 Sample Security

Subsamples are collected by the drillers, sealed into Kraft packets with barcodes and submitted for assay. Cardboard boxes holding 50 packets are delivered at the end of each shift, by the drilling crew, to secure sample storage facilities. Unfilled boxes are stored in the drill support vehicle and completed in the next shift.

The filled sample boxes are stacked onto pallets in batches of 40 (i.e., 2,000 samples), wrapped with plastic and dispatched by courier to the Bella assay facility at the curtailed Kwinana Refinery.

8.2 Sample Preparation

Upon receipt by Bella, the sample barcodes are scanned and checked against the submission data in the Bella LIMS. Each sample packet is then split open at the top, placed in a cardboard drying tray and oven-dried at 100°C for 10 hours. The packets are transferred to a customized holder in batches of about 60, with a control between each batch, and automatically fed to a bank of 10 Rocklabs flow-through ring mills (Figure 8-1), each of which have three concentric milling rings. The barcode is read, the sample is pulverized, a subsample is rotary split, captured in a single-use plastic Petri dish with the barcode printed on the lid, then sent to the spectral analyzer for assay. The ring mills are air flushed and vacuumed between samples.

Each sample is pulverized to a nominal grind size of 85% passing 180 µm. The ring mill discharges through a chute and rotary splitter, retaining 80 to 100 g and discarding the rest. One of the ring mills is set up to take two splits and these are used for pulp duplicate assays and to generate the Reference (REF) samples. These are sent to the KWI for wet chemical assay checking of the spectral assay. Pulverized samples are stored in a barcoded dedicated receptacle for assay (Figure 8-2).

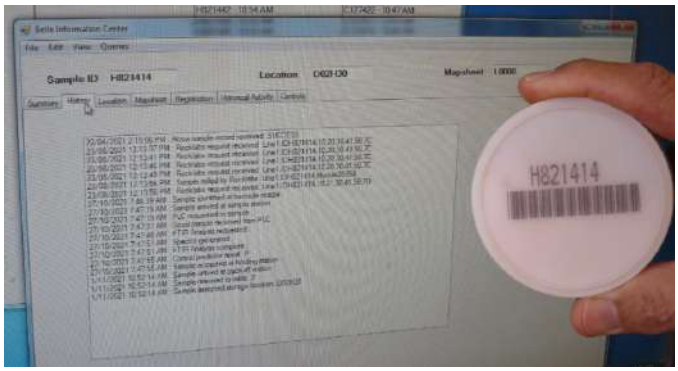
The robotic system can run 24 hours a day handling approximately 3,000 samples per day. Only the Mineral Resource estimation samples are processed at Bella with all other stockpile and processing control samples processed using the same methods as the REF samples.

Figure 8-1: The Bella Robotic Sample Preparation using Rocklabs Ring Mills (SLR, 2021)

Figure 8-2: The Pulverized Sample is Stored in a Barcoded Dedicated Receptacle for Assay (SLR, 2021)

A LIMS system controls the progress of the sample packet through the whole of the sample preparation and assay procedure enabling digital tracking of all stages (Figure 8-3). This ensures *inter alia* that the sample is valid, not previously assayed, and the assay looks like one for a bauxite sample. It also generates pulp duplicates at a frequency of 1 in 100 which are also the REF samples.

Figure 8-3: The Pulverized Sample is Tracked Digitally Through the Bella Preparation and Assaying (SLR, 2021)



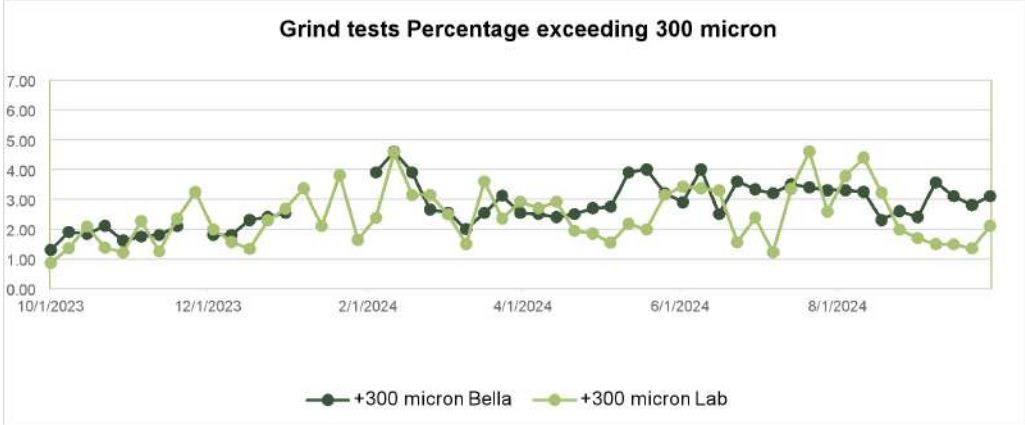
Grind size monitoring is carried out with the advantage of the robotic sample preparation being consistent grind size. A risk with all such systems is the possibility of contamination between samples. This is usually avoided by inserting blank samples of zero grade into the sample processing stream. The difficulty is that the blank samples may themselves contaminate the next sample being assayed.

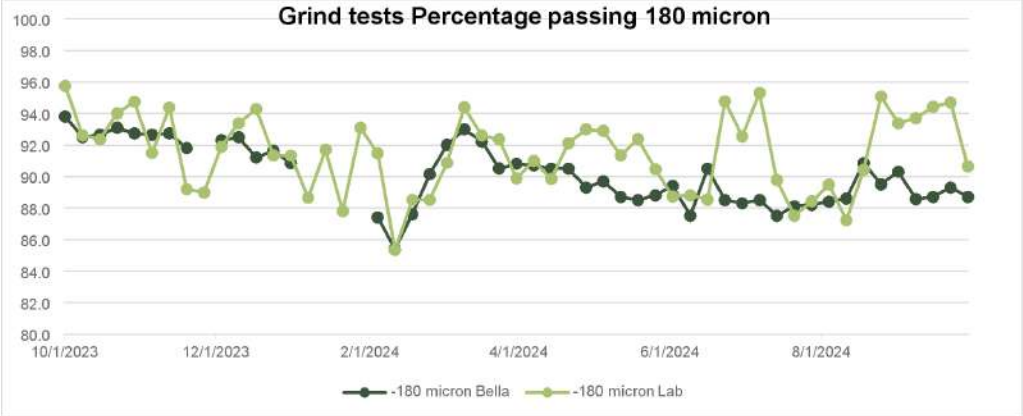
Quality control (QC) procedures were developed and implemented to monitor the Bella robotic sample preparation system (Franklin, 2019) and they include:

- Temperature testing on the ovens. These are recorded between 2 and 5 times a year since 2017 at 8 positions for each of 4 ovens and demonstrate consistent safe drying temperatures below 100°C (average 97.9°C for 352 readings).

- Daily grind size checks. The percentage passing 180 microns and percentage exceeding 300 microns is recorded at Bella on all 10 ring mills at a rate of 1:200 for the resource drill samples, with independent checks by the KWI on a random selection of all samples milled for the week. These demonstrate satisfactory sample preparation, and the consistency of the Bella robotic system, which is critical for effective FTIR assaying (Figure 8-4).

Figure 8-4: Sample Preparation Monitoring: Grind Sizes for the Robotic Sample Preparation Unit Tested by Bella and by KWI





8.3 Assaying

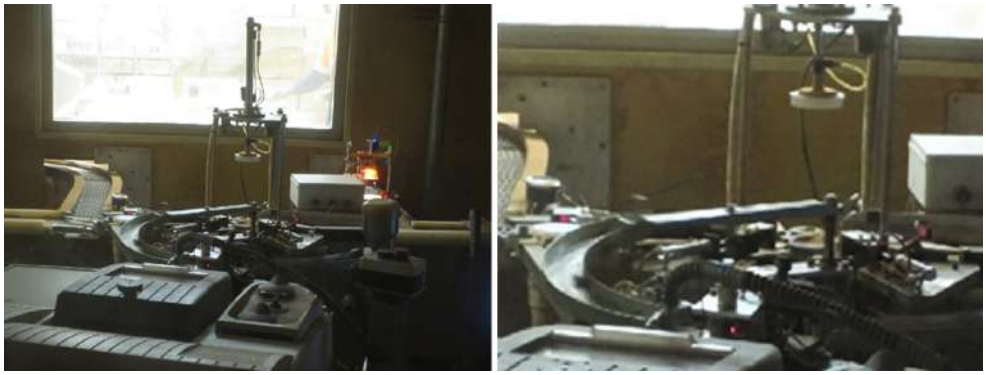
Assaying of the drill samples is based on a spectral method, using a Nicolet 6700 FTIR Spectrometer with a robotic feeder (Figure 8-5). FTIR obtains an infrared absorption spectrum from the sample. The FTIR spectrometer simultaneously collects high-resolution spectral data over a wide spectral range. A mathematical process (Fourier transformation) converts the raw data into the actual spectrum for subsequent determination of the component analytes.

All drill samples are currently assayed using a customized, bespoke FTIR method, with the final corrected results used for Mineral Resource estimation. Calibration and monitoring of the FTIR results are done using the Reference Method assay results.

Bella generates the raw FTIR spectral dataset for each sample, which is transferred to the Alcoa LIMS system for post-processing. Alcoa performs all the Reference Method analyses at KWI.

The FTIR spectra are determined using a robotic scoop arm that collects an approximately 5 g aliquot of the pulp from the Petri dish and presents it to a platinum crucible. The material in the crucible is pressed flat to ensure an even surface for scanning. The crucible is then rotated several times through the spectrometer and 20 scans are conducted on the aliquot. The scans are processed and validated by the Bella system and when accepted, they are then transferred to the Alcoa LIMS system for post-processing and further validation.

Figure 8-5: The Robotic FTIR Assaying Equipment (RHS shows the sampling scoop arm and pulp dish with the lid elevated) (SLR, 2021)



8.3.1 FTIR Method Assays and the CalVal Dataset

The FTIR Method for bauxite assay uses infrared absorption spectra to characterize the presented sample for multiple analytes as element, compound, or mineral percentages. The approach has been developed using an extensive calibration and validation (CalVal) dataset, constant monitoring of Reference samples and Standards, and periodic revision of the prediction algorithms.

In 1990, an initial set of approximately 2,300 CalVal samples was collected covering the Darling Range tenement. A subset of approximately 700 samples was used to develop the initial FTIR prediction model. Extra CalVal samples have been added to help predictions in areas of low Reactive Silica (less than 0.5% Si) and high Total Iron (greater than 50% Fe). The CalVal samples are run randomly through the FTIR equipment in triplicate, under differing conditions (time of day, season, operator, order, etc.) to test for external factors. The FTIR results based on the prediction model algorithm are monitored using the REF assays (Franklin, 2019).

Initially some FTIR analytes (Available Alumina, Total Iron, Carbonate, Sulphate, Total Silica, Total Phosphorus and Magnetic Susceptibility) were all determined using a ‘common’ algorithm, whereas Reactive Silica, Oxalate, Extractable Organic Carbon, Total Alumina and Boehmite each used a specific algorithm. Since 2017 specific algorithms have been used for all analytes. The algorithms are periodically updated, typically if there has been a change in equipment or Reference Method. Retaining all FTIR spectra now means additional analytes can be

determined using specific algorithms, with three new analytes being added to Method Set MIC#00005 in 2021 (Potassium, Titanium and Gallium).

8.3.2 Reference Method (REF) Assays

The REF assaying is done by Alcoa in the KWI to validate and calibrate the FTIR assays. This is a suite of assays and tests that are carried out by wet chemical and other means and has included:

- XRF x-ray fluorescence spectroscopy
- ICP-OES inductively coupled plasma optical emission spectrometry
- XRD x-ray diffraction
- MS magnetic susceptibility, a proxy for grindability
- BD-ICP bomb digest in a caustic solution, with an ICP-OES finish
- BD-GC bomb digest in a caustic solution, with a gas chromatography finish
- BD-NDIR bomb digest in a caustic solution, with a non-dispersive infrared finish
- MD-ICP microwave digest in a caustic solution, with ICP-OES finish

There are differences in the nature of these tests. Both XRF and ICP methods are instrument-based methods designed to replicate wet chemical analysis results, either total or partial assays depending on the digestion. Both XRD and MS methods are used to investigate mineralogy contents so they are regarded as proxies for assays. Bomb digest (BD) methods have been developed by the alumina refining industry to determine the expected yield of bauxite ore during processing. They are the basis for ‘metallurgical assays’ that are designed to replicate the physicochemical reactions in the refinery and accordingly may be customized for a particular ore type or process plant. At Alcoa some BD assaying has been replaced with a microwave digest (MD) method.

8.3.2.1 REF Assaying Methods

A summary of the assaying used for the REF samples, which are used to calibrate and validate the FTIR Method, is provided in Table 8-1.

Table 8-1: Assaying Methodologies for Resource Estimation Samples

Name	Analyte	Code	Units	Reference Method
Available Alumina	A.Al_2O_3	AL	%	MD – ICP (MALSI)
Reactive Silica	R.SiO_2	SI	%	MD – ICP (MALSI)
Total Iron	Fe_2O_3	FE	%	XRF and FTIR
Oxalate	NaC_2O_4	OX	kg/t	BD – GC
Carbonate	Na_2CO_3	CO	kg/t	BD – NDIR (TICTOC)
Extractable Organic Carbon	C	EO	kg/t	BD – NDIR (TICTOC)
Total Phosphorous	P_2O_5	PT	%	XRF
Sulphate	Na_2SO_4	SU	kg/t	XRF

Total Silica	SiO_2	ST	%	XRF
Magnetic Susceptibility	MagSus	MS	None	MS (CGS system)
Total Alumina	Al_2O_3	AT	%	XRF
Boehmite	AlO(OH)	BO	%	XRD

The bomb digest (BD) method involves adding a measured amount of carbonate free 52% caustic soda to the sample aliquot (1 g), sealing it in a small 10 mL pressure vessel and then cooking it at 145°C. After cooling, the solution is assayed by titration or other methods to determine the alumina and silica contents. As the digestion of these elements by the hot caustic solution is determined by the physical conditions during digestion (mainly temperature and pressure) the results provide a proxy for the expected performance of ore of that nature in the alumina refinery plant. The resulting assays are termed available alumina (AL) and reactive silica (SI), measured as percentages.

The MD method was introduced in 1996 to supplant the BD methods for assaying of the Mineral Resource drill samples. Atmospheric digestion is done in a microwave oven using a 13% caustic solution. The advantage of this is that it is faster, more repeatable and uses a bigger aliquot (0.5 g). The MD assays are collectively named ‘microwave available alumina and reactive silica’ (MALSI). The BD methods are still used for the refinery monitoring samples including those taken from the sampling towers prior to the feed stockpiles of crushed ore.

Following digestion using either MD, BD, or wet chemical methods, the analytes are assayed (Table 8-1) using the following methods (Figure 8-6):

- For ICP the digestion liquor is read using a PerkinElmer Optima 8300 machine.
- For XRF an aliquot of 0.7 g is combined with a lithium borate flux, fused in platinum crucibles on a dedicated Phoenix 8-bank burner, and batches are assayed on an Axios Max PW4400 machine.
- For gas chromatography (GC) a 1.00 g aliquot is used and assayed on an Agilent 7890B machine.
- For Total Inorganic Carbon and Extractable Organic Carbon (TICTOC) a 1.00 g aliquot is digested and assayed using an Analytical Aurora 1030 Total Organic Carbon Analyzer with carousel.

Figure 8-6: Digestion and Assay Equipment used for REF Samples at the KWI Clockwise from top left: BD, MD, TICTOC, ICP, XRF, GC (SLR, 2021)

Details on the assaying method used for the final (Best) assay value for every sample interval are carried in the acQuire database.

For resource estimation, the Reference Method results are used to monitor the performance of the FTIR assaying, and to calibrate (adjust) the FTIR results on a batch-by-batch basis. The Reference Method is also used for all monitoring of the refinery performance including the grades of ore presented to the sampling towers at Pinjarra and Wagerup prior to stockpiling and reclaiming of the ore feed.

A consistent approach to sample collection, preparation and assaying for Mineral Resource estimation has been used since 1980. Refinements to the assaying methods have comprised:

- 1996 Microwave digestion was introduced instead of bomb digestion for the REF samples.
- 1999 The collection of the FTIR spectral data was outsourced to Bella, with direct control of processing and prediction still done by Alcoa.
- 2006 Robotic sample preparation was introduced at Bella.
- 2006 Digital retention of all FTIR spectral data was introduced, enabling additional post-processing of assayed samples for new analytes.
- 2017 The calibration sets were rescanned with FTIR and an updated Method Set (MIC#00005), was developed.
- 2018 Original wet chemical assays were replaced by FTIR for approximately 73,000 samples (drilled in Myara North from 1992 to 2002).
- 2019 Original wet chemical or FTIR assays were replaced by FTIR for approximately 251,000 samples (drilled in Myara North from 1991 to 1997).

The impact of these changes and validation of the results were investigated by Alcoa personnel and independently by SRK (2021a). It was concluded that the assaying precision (i.e. repeatability) and accuracy (lack of bias, as demonstrated by quantile-quantile plots) did not show significant differences between the pre-2018 and post-2018 data sets.

Since completion of the 2023 Mineral Resource inventory, an additional 70,253 vacuum and aircore holes have been drilled and approximately 710,870 routine FTIR analyses performed. These represent holes drilled between September 2023 and June 30, 2024.

8.4 Quality Assurance and Quality Control

Quality assurance (QA) consists of evidence that the assay data has been prepared to a degree of precision and accuracy within generally accepted limits for the sampling and analytical method(s) to support its use in a Mineral Resource estimate. Quality control (QC) consists of procedures used to ensure that an adequate level of quality is maintained in the process of collecting, preparing, and assaying the drilling samples.

8.4.1 QA/QC Protocols

The following QA/QC protocols are implemented and managed by Alcoa's team, and QA/QC samples are not blind to the laboratory, with the exception of Sample To Extinction (STE). Batches of samples are submitted to the Bella laboratory daily. Internal standards created from the stockpile of the Darling Range bauxite are introduced by the Bella Laboratory every 50 samples during the FTIR analysis to check the chain of process. All standard sample insertions and batches maintain consecutive numerical order. Calibration is done at first to generate the reference mean of the standard as well as the acceptable minimum and maximum values totaling three standard deviations.

After the boxes of drill samples are received at Bella, packets of Reference Method samples (REF) are split out by the robotic sample preparation, based on a random selection by Alcoa LIMS, at a frequency of 1 in 100 (1%). These are submitted to the KWI in batches of 19 for REF assaying to calibrate and validate the quality of the FTIR Bella assays. As the FTIR assays are adjusted to match the REF assays (using a 'broken stick' curve adjustment to remove bias and maintain precision) it is expected that there should be minimal bias between REF and FTIR corrected results (FTIR_corr). However, the repeatability between the two methods is an important attribute of the quality of the assay results used for Mineral Resource estimation. Each batch of REF samples includes 1 Blank and 1 Standard. The REF samples are considered to serve the same purpose as pulp repeats in defining the repeatability of the assays. Alcoa also sends checks of REF samples assayed at Bella and KWI to an independent laboratory, Bureau Veritas (BV).

Alcoa introduced in 2018 an alternative procedure to field duplicates, termed Sample To Extinction (STE). This involves taking the normal 0.5 m drill sample (referred to as the Parent) and collecting all the residue from that drilled interval (i.e. the riffle split reject, and previously any material left in the sampling cup). This residue is collected once per shift from each rig under supervision by the geologist. The residue is pulverized and homogenized, then two equal splits (referred to as the Daughters) are assayed.

Following receipt of results from the laboratories, Alcoa geologists review the values, and sample batches identified as anomalous are repeated by the laboratory. Monthly and quarterly QA/QC reports are produced to detect and address potential temporal trends or issues in their results.

The following are the existing written QA/QC procedures available to all staff:

- Franklin (2019) describing the FTIR process.
- Use of the customized in-house Exploration PowerApps digital module to record and document field inspections by the geologist at the drill rigs (documenting visible contamination, Sample ID, Hole ID, splitting, chip size of sample, split volume, depth measurement, collection of Sample To Extinction (STE) samples, collection of further FTIR calibration and validation (CalVal) samples, as well as other prestart, safety, risk and EHS inspections.
- Procedures for generating STE samples.
- Various PowerPoint presentations providing an overview of the laboratory procedures.

QP reviewed QA/QC information compiled in the previous report (SLR, 2023) and analyzed the new QA/QC data compiled by Alcoa between November 2023 and September 2024. The findings of this analysis are presented in the subsequent sub-sections.

8.4.2 Blanks

Blanks are not routinely introduced in FTIR submission batches into the robotic mills at Bella and there is no check on cross-contamination during sample preparation. Given the style of mineralization, the ore grades being assayed, and the volume of material milled compared to the final aliquot assayed, the absence of sample preparation blanks is not considered material. There is also no available blank sample on the market that would not introduce contamination of the mills by very low-grade samples at Bella. KWI laboratory submits blanks with a frequency of 1 to 19 in the REF samples sets compiled and dispatched regularly by Bella, however that information was not available for review.

8.4.3 Standards

Standards evaluate accuracy of the assaying by detecting the differences between a result and an expected value, also known as a bias. Alcoa has used a series of specially prepared Internal Reference Material (IRM) samples derived from Darling Range bauxite, pulverized and homogenized by Gannet Holdings, labelled KH09 to KH20. Between 2021 and 2024, only IRM KH14 and KH20 have been used at the Bella Laboratory and KH10 at the mining laboratory. Monitoring using these IRM samples provides arguably better assurance of assaying accuracy than commercial Certified Reference Material samples. The IRMs have generally been sourced from stockpile material and used in both coarse-crushed and pulp form. The IRMs have not been externally certified. A summary of the IRMs used is provided in Table 8-2.

Table 8-2: Standards Used for Drilling and REF Monitoring (IRMs)

Standard	Date	Comment
KH09	May 1999 to present	Boehmite analysis, FTIR, MD-ICP, and XRF analysis Mining reference analysis (IRM)
KH10	May 2012 to present	Mining reference analysis (IRM)
KH11	July 2008 to March 2015	FTIR analysis (IRM)
KH12	July 2008 to April 2014	Grind size control (IRM)
KH13	April 2014 to present	Grind size control (IRM)
KH14	March 2015 to October 2021	FTIR analysis (IRM)
KH15	October 2015 to September 2017	Preparation and analytical control – introduced at the drill rig (IRM)
KH16	September 2017 to December 2018	Preparation and analytical control – introduced at the drill rig (IRM)
KH17	September 2017 to December 2018	Preparation and analytical control – introduced at the drill rig (IRM)
KH18	September 2017 to December 2018	Preparation and analytical control – introduced at the drill rig (IRM)
KH20	October 2021 to present	FTIR analysis (IRM)

Control of the accuracy of FTIR samples is currently monitored at the Bella laboratory using IRM KH20. The IRMs are inserted every 50 FTIR samples. FTIR batches totaling 48,855 samples of KH20 analyzed primarily between November 2023 to September 2024 and using Priority Codes P202 to P212, BV002 to BV004, and INT001 grouped by quarters, were sent to SLR for review. Priority Codes represent batches assayed by the FTIR Method using the same batch correction factors.

The QP reviewed all batches from either KH10 or KH20, adhering to the failure limits set by Alcoa, which are three standard deviations (SD) from the expected value. The QP evaluated the available alumina (AL), reactive silica (SI), and iron (FE) through extended timeline series to identify potential bias trends or systematic outliers.

In general, IRMs exhibited robust accuracy biases, ranging from -0.03% to 3.4% for the elements AL, FE, and SI as summarized in Table 8-3. These results were obtained with a controlled number of failures across all three grade IRM categories: low-grade, intermediate-grade, and high-grade.

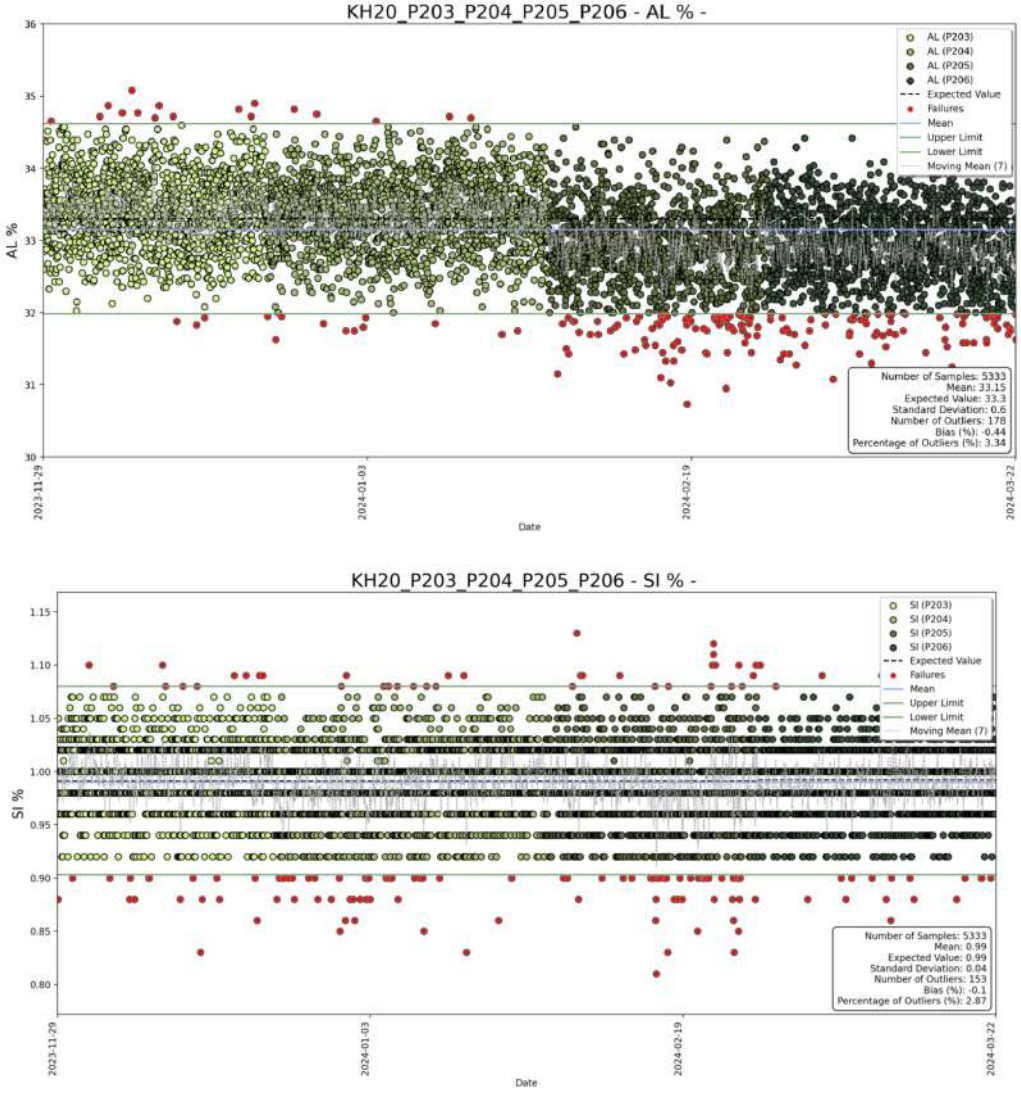
Table 8-3: Performance of IRM Samples used in the 2023 - 2024 QA/QC Programs.

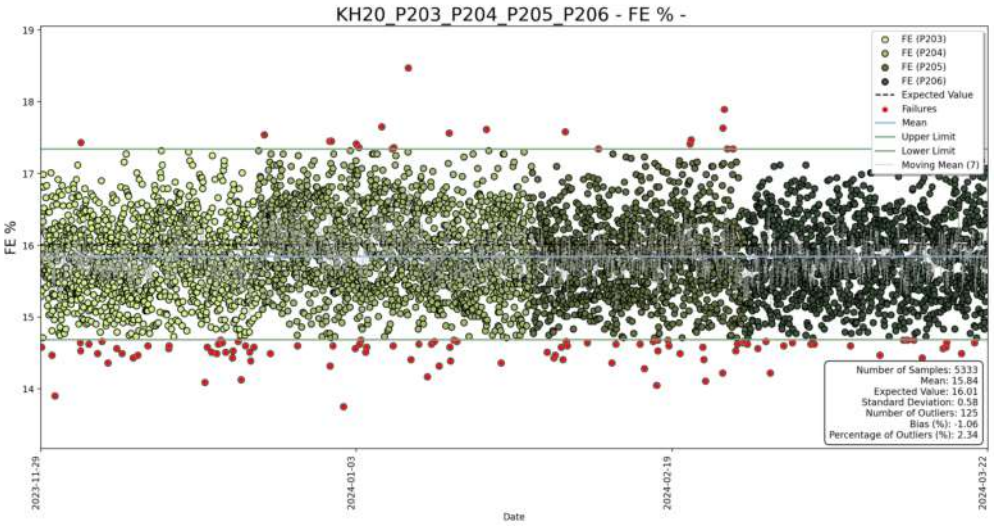
IRM	Element	Unit	Year Quarter	N Samples	Mean	EV	SD	N Outliers	Bias (%)	Outliers (%)	Upper Limit	Lower Limit
KH20_BV002	AL	%	2023Q4	1010	31.52	31.53	1.4	2	-0.02	0.2	35.63	27.43
	FE	%		1010	16.39	16.38	1.23	3	0.04	0.3	20.04	12.72
	SI	%		1010	1.03	1.03	0.11	6	0.02	0.59	1.35	0.71
KH20_BV004	AL	%	2023Q4	339	34.55	34.55	0.91	3	0	0.88	37.28	31.82
	FE	%		339	16.51	16.51	0.8	0	-0.02	0	18.92	14.1
	SI	%		339	0.86	0.86	0.02	0	0.09	0	0.92	0.8
KH20_P202	AL	%	2023Q4	1417	33.44	33.24	0.54	21	0.61	1.48	34.56	31.92
	FE	%		1417	15.87	16.12	0.6	34	-1.54	2.4	17.45	14.79
	SI	%		1417	1	1.03	0.04	170	-3.42	12	1.12	0.94
KH20_P203_P204_ P205_P206	AL	%	2023Q4 - 2024Q1	5333	33.15	33.3	0.6	178	-0.44	3.34	34.62	31.98
	FE	%		5333	15.84	16.01	0.58	125	-1.06	2.34	17.34	14.68
	SI	%		5333	0.99	0.99	0.04	153	-0.1	2.87	1.08	0.9
KH20_INT001	AL	%	2024Q2	460	33.35	33.36	0.89	0	-0.01	0	38.72	27.99
	FE	%		460	16.54	16.54	0.66	0	-0.02	0	19.58	13.5
	SI	%		460	1.06	1.06	0.05	0	-0.45	0	1.27	0.84
KH20_P207_P209_ P210_P208	AL	%	2024Q2	5000	32.99	32.95	0.54	66	0.13	1.32	34.27	31.63
	FE	%		5000	15.85	15.82	0.58	96	0.21	1.92	17.14	14.49
	SI	%		5000	0.98	0.98	0.04	68	-0.03	1.36	1.07	0.89
KH10	AL	%	2024Q3	549	35.09	35.13	0.63	1	-0.13	0.18	36.93	33.34
	FE	%		518	15.55	15.52	0.1	0	0.18	0	15.9	15.13
	SI	%		549	1.01	1.01	0.03	14	0.16	2.55	1.08	0.94
KH20_BV003	AL	%	2024Q3	328	31.94	31.95	1.12	0	-0.03	0	35.32	28.58
	FE	%		328	16.74	16.74	0.92	1	0	0.3	19.49	13.98
	SI	%		328	1.15	1.15	0.1	1	-0.42	0.3	1.46	0.84
KH20_P211_P212	AL	%	2024Q3	2398	32.95	33.03	0.55	39	-0.26	1.63	34.34	31.71
	FE	%		2398	15.84	15.85	0.57	38	-0.04	1.58	17.18	14.52
	SI	%		2398	0.98	0.99	0.04	58	-0.58	2.42	1.08	0.9

SLR selected three IRMs KH20 series for in-depth analysis, based on the number of samples utilized over the entire timeline from the fourth quarter of 2023 to the third quarter of 2024. This selection includes samples from batches P202 to P212.

The results from the IRM KH20, analyzed by the laboratory between Q4 2023 and Q1 2024, as shown in Figure 8-7, include batches P203, P204, P205, and P206. These batches exhibit a slight negative bias of -0.4% for available alumina (AL), particularly in batches P205 and P206, with 146 instances falling below the -3SD threshold. Although this bias remains below the ±5% threshold, its negative trend makes it worthwhile to investigate the cause and implement corrections to avoid future issues. Conversely, reactive silica (SI) maintains a bias of -0.1%, with 2.8% of outliers, and iron (FE) shows a bias of -1%, with few failures falling below the lower limit.

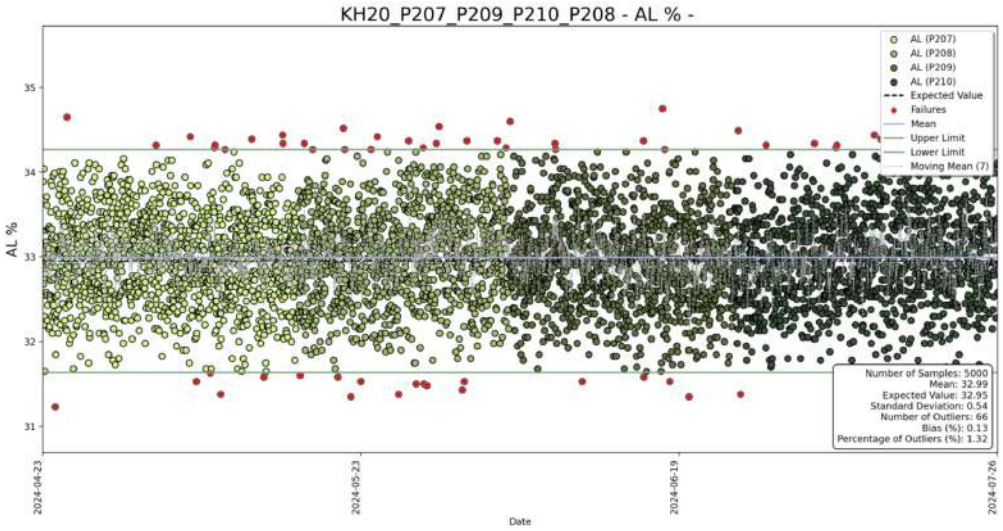
Figure 8-7: KH20 control chart of AL, SI, and FE

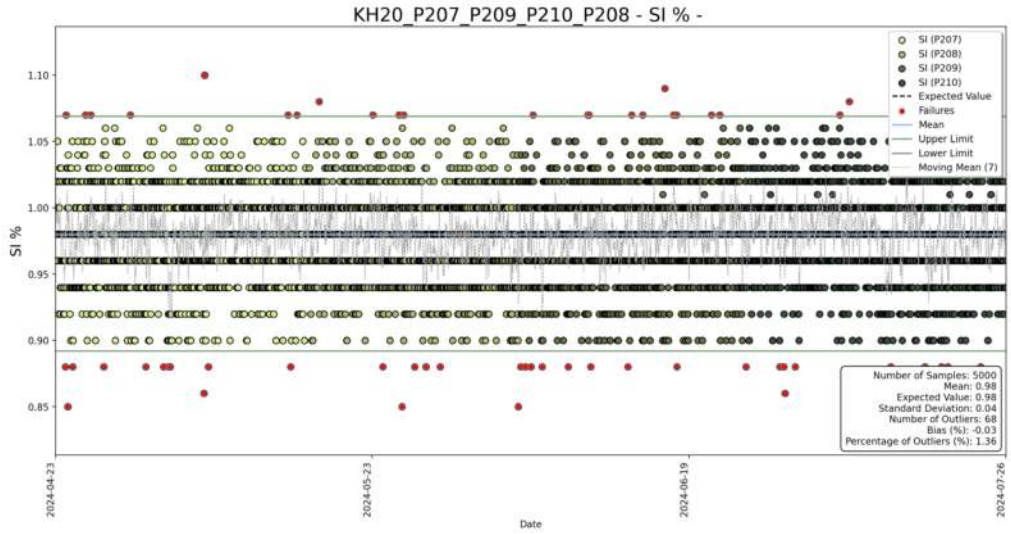




The IRM KH20 including batches P207 to P210, visualized in Figure 8-8, analyzed between Q2 and part of Q4 2024, shows more stable results with a minimal bias of 0.1% for AL, -0.03% for SI, and 0.21% for FE, and a controlled number of failures. This confirms an improved performance compared to batches P203 to P206. Similarly, batches P211 and P212, analyzed during the third quarter of 2024, display most results within threshold limits and low biases ranging from -0.04% to -0.58% for AL, SI, and FE, as observed in Figure 8-9.

Figure 8-8: KH20 control chart of AL, SI, and FE: Q2 2024 and Q3 2024




KH20_P207_P209_P210_P208 - SI % -
SI (P207)
SI (P208)
SI (P209)
SI (P210)
Expected Value
Failures
Mean
Upper Limit
Lower Limit
Moving Mean (7)
SI %
1.10
1.05
1.00
0.95
0.90
0.85
Number of Samples: 5000
Mean: 0.98
Expected Value: 0.98
Standard Deviation: 0.04
Number of Outliers: 68
Bias (%): -0.03
Percentage of Outliers (%): 1.36
2024-04-23
2024-05-23
2024-06-19
2024-07-26
Date

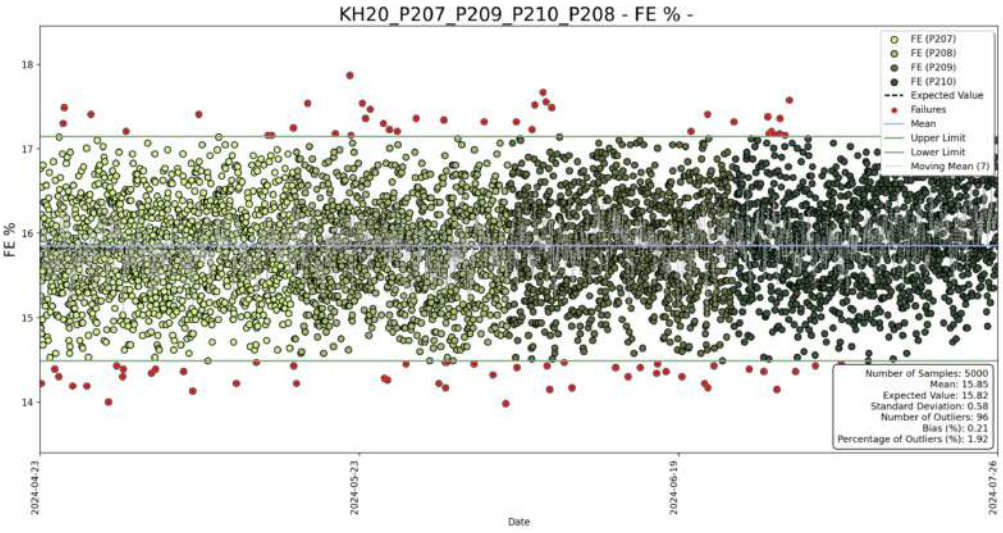
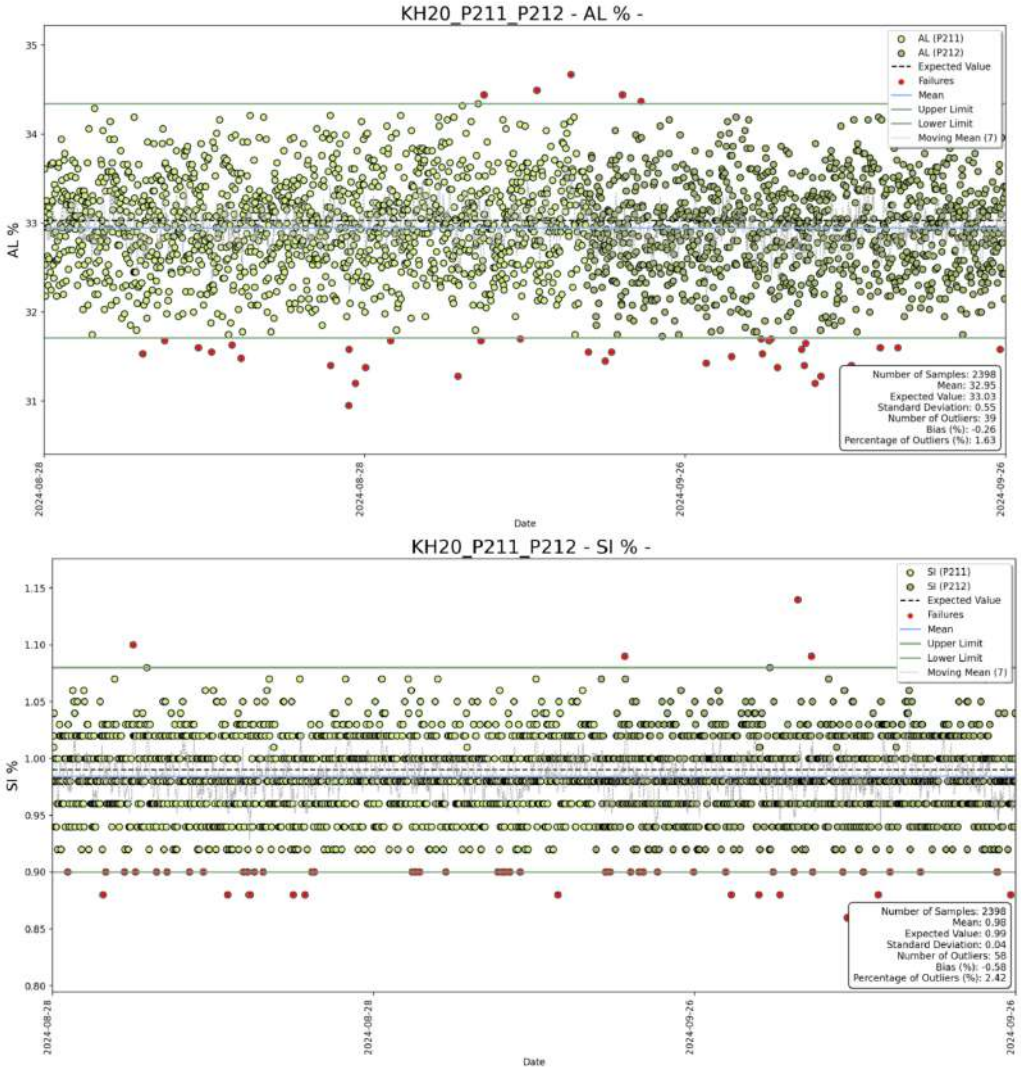
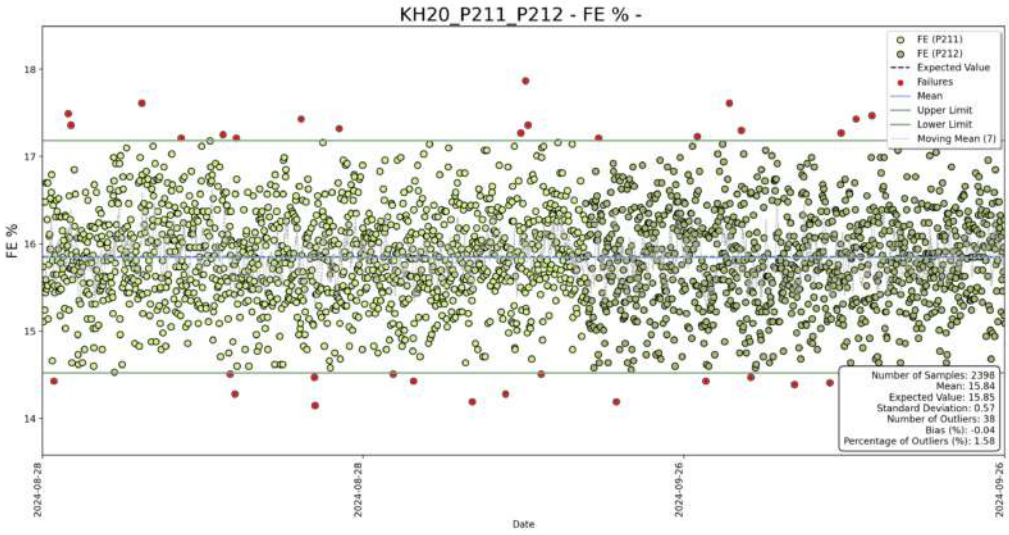

KH20_P207_P209_P210_P208 - FE % -
FE (P207)
FE (P208)
FE (P209)
FE (P210)
Expected Value
Failures
Mean
Upper Limit
Lower Limit
Moving Mean (7)
FE %
18
17
16
15
14
Number of Samples: 5000
Mean: 15.85
Expected Value: 15.82
Standard Deviation: 0.58
Number of Outliers: 96
Bias (%): 0.21
Percentage of Outliers (%): 1.92
2024-04-23
2024-05-23
2024-06-19
2024-07-26
Date

Figure 8-9: KH20 control chart of AL, SI, and FE: Q3 2024 and Q4 2024





8.4.4 Duplicates

Duplicate samples help monitor preparation, assay precision, and grade variability as a function of sample homogeneity and laboratory error. The field duplicates are used to evaluate the natural variability of the original core sample, as well as detect errors at all levels of preparation and analysis including core splitting, sample size reduction in the preparation laboratory, subsampling of the pulverized sample, and analytical error. Coarse reject and pulp duplicates provide a measure of the sample homogeneity at different stages of the preparation process (crushing and pulverizing).

8.4.4.1 Field Duplicates

In January 2018, Alcoa discontinued the routine collection of field duplicates due to the limited benefits and issues with the sample splitting procedure (SLR, 2022). Consequently, no further data is available for review regarding field duplicates. This process has been replaced by the Sample to Extinction method, detailed in Section 8.4.4.4.

8.4.4.2 Check Assay – Umpire Laboratory Checks

Alcoa sends checks of REF samples assayed at Bella Lab to an independent laboratory, Bureau Veritas Minerals (BV), in Canning Vale, Western Australia for an impartial review. BV holds NATA accreditation No.626 and it is accredited for compliance with ISO/IEC 17025 – Testing. SLR was handed out a spreadsheet to examine, with a total of 5,366 samples that covered the original Bella and REF values as well as the results from the analytes re-assay by FTIR at BV. Results from the REF comparison with BV can be visualized in the form of scatter plots and quantile-quantile plots in Figure 8-10 to Figure 8-12 for AL, SI, and FE.

Results for AL show an acceptable difference of 0.1% between means and a very strong correlation of 0.977 for 5,336 pairs. The quantile-quantile plot suggests there does not seem to be any systematic bias in the measurements; since the data points follow the trend line closely and are consistent across the range of values. The analysis of SI showed a difference between

pairs of -1.9%. Bureau Veritas is reporting marginally lower values from 0% to 1%, slightly higher values between 1-6%, and exhibits a low to moderate bias above 6%. However, the correlation of 0.982 is considered good for 5,265 pairs and it may be worth noting that both populations are statistically similar. Similarly, the results of FE demonstrated a good correlation, with a coefficient of 0.985 and a low difference between means of 0.6%.

Figure 8-10: Scatter Plot, Quantile-Quantile Plot and Statistics of AL Umpire Laboratory Checks – Bella and Bureau Veritas

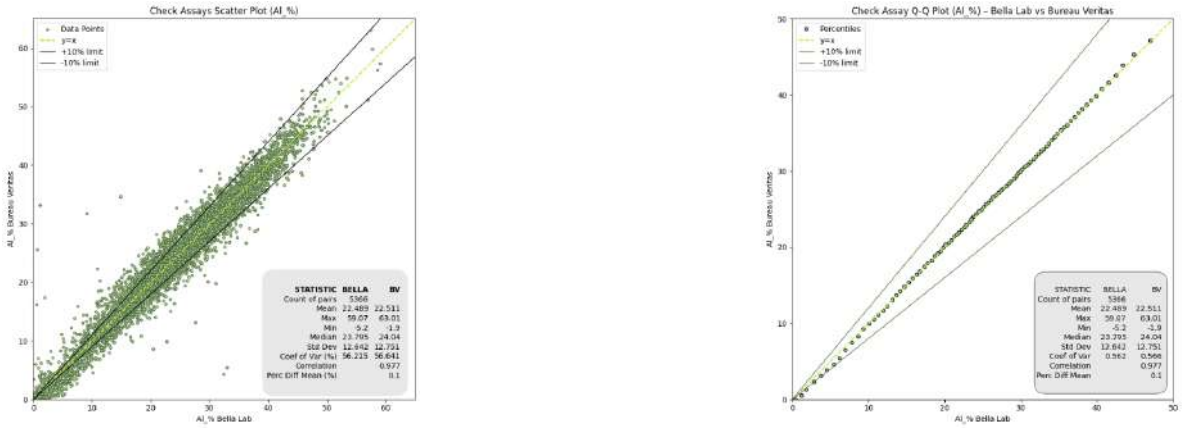


Figure 8-11: Scatter Plot, Quantile-Quantile Plot and Statistics of SI Umpire Laboratory Checks – Bella and Bureau Veritas

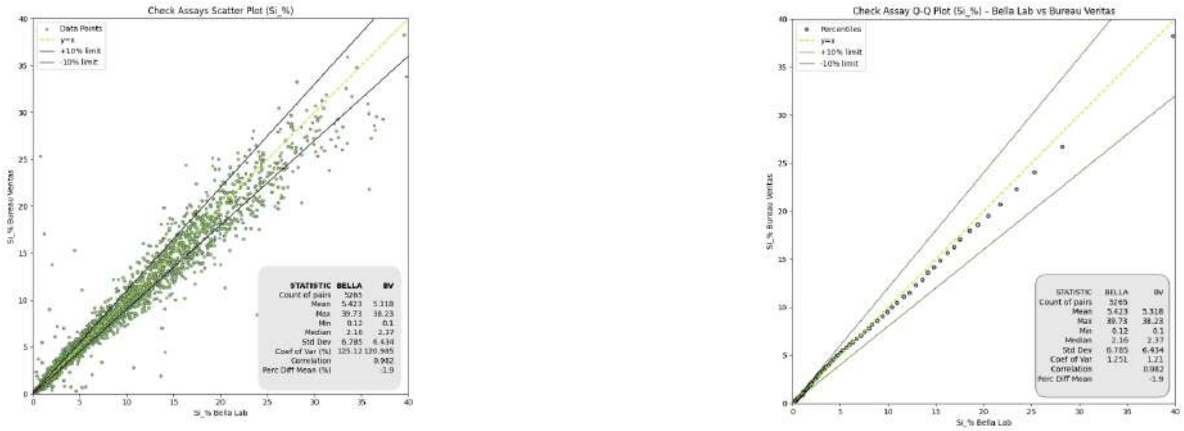
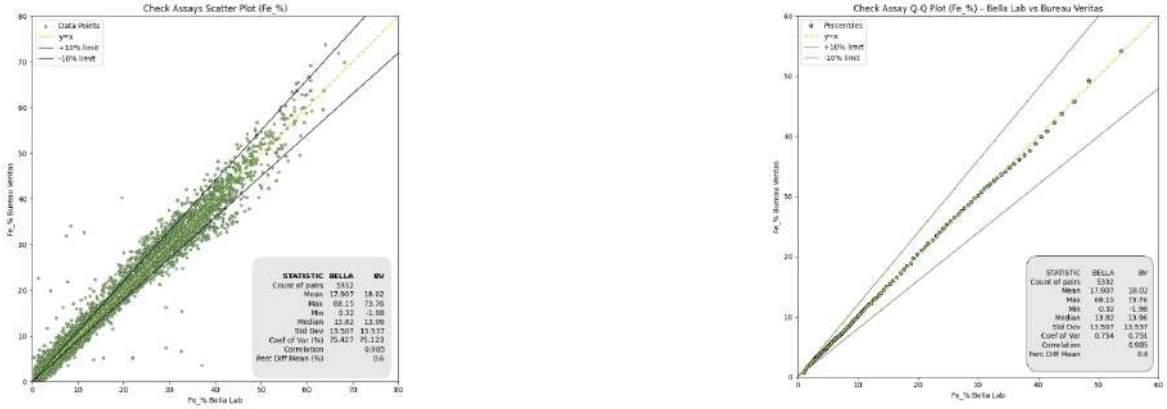


Figure 8-12: Scatter Plot, Quantile-Quantile Plot and Statistics of FE Umpire Laboratory Checks – Bella and Bureau Veritas



8.4.4.3 Twinned Hole Studies

Since the last report (SLR, 2023), the twin hole studies campaign has been suspended because of its limited value and therefore, no additional data is available for an updated analysis.

8.4.4.4 Sample To Extinction (STE) Samples

Following several reviews of the data sets from 2018 to 2021 by independent consultants, biases and poor repeatability were identified. The investigation suggested that the splitting process at the drill rig might have been flawed. It highlighted the sampling principle that pulverizing (reducing particle size) before splitting can significantly reduce errors. Based on these studies and external reviews, modifications were made to the splitting procedure at the rig.

Since 2020, Alcoa has refined the STE sampling procedure to collect one sample per shift from each drill rig and assay three Daughters after pulverizing and splitting. The 2023-2024 STE clean dataset, reviewed by SLR, included results for 380 pairs. SLR utilized this dataset to generate bivariate statistics, scatter plots, and quantile-quantile plots.

Comparisons were carried out for the analytes AL, SI, and FE between:

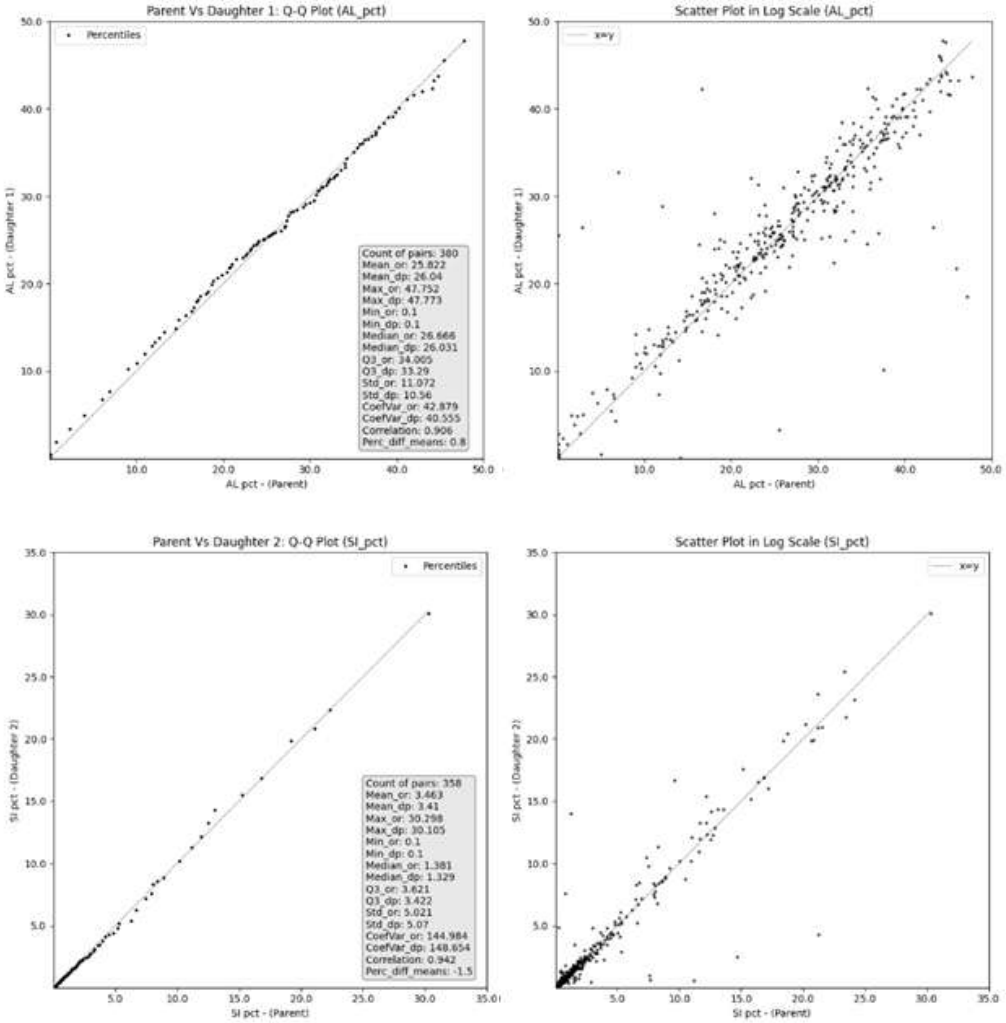
- Daughter 1 vs the Parent
- Daughter 2 vs the Parent
- Daughter 3 vs the Parent
- The average of the Daughters vs the Parent

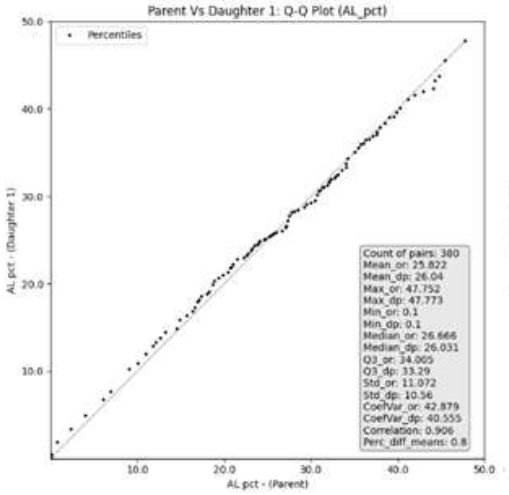
The evaluation of Parent-Daughter samples demonstrated reliable repeatability for the residue pulp repeats, indicating consistent test results across multiple trials. While the correlation between the tests was strong, the precision of the match was not perfect, with correlation coefficients ranging from 0.912 to 0.956. The Daughters (D1, D2, and D3) closely matched the original Parent sample, suggesting that the sample preparation and division methods were executed correctly.

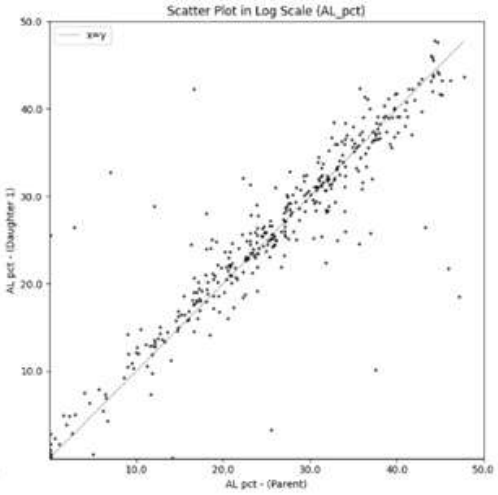
The available alumina (AL) results demonstrate overall good reproducibility, with a correlation coefficient of 0.91 when comparing parent samples to D1, D2, and D3. A slight shift in bias from positive to negative is observed at approximately 25%, even though the minimal difference of 0.8% between the means confirms the reproducibility. Conversely, reactive silica (SI) results exhibit some fluctuation along the 45-degree line, particularly at grades of 5% and above, but maintain a good correlation of 0.94 and a mean difference of -1.5% for D2. In contrast, iron (FE) results show a strong correlation coefficient of 0.96 and excellent reproducibility across all grade ranges. Examples are provided in Figure 8-13 for AL, SI, and FE.

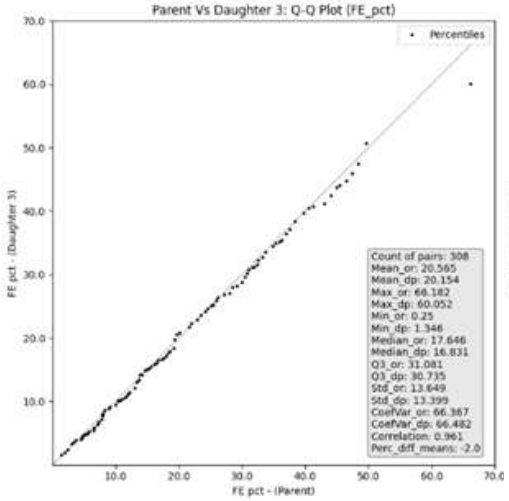
Regarding Average Daughter samples compared to Parent results, the data indicates good repeatability, as anticipated. This suggests that the split taken at the drill rig (parent sample, reduced to 150 g) provides a representative measure of the drill interval grade. This method is as effective as collecting the entire residue followed by pulverizing, homogenization, and splitting, as visualized in Figure 8-14.

Figure 8-13: Quantile-Quantile Plot (On the left) and Scatter Plots (on the right) of Parent and Individual Daughters' Analysis of AL,SI and FE




Parent Vs Daughter 1: Q-Q Plot (AL_pct)
Percentiles
Count of pairs: 380
Mean_or: 25.822
Mean_dp: 26.04
Max_or: 47.752
Max_dp: 47.773
Min_or: 0.1
Min_dp: 0.1
Median_or: 26.666
Median_dp: 26.031
Q3_or: 34.069
Q3_dp: 33.29
Std_or: 11.072
Std_dp: 10.56
CoefVar_or: 42.879
CoefVar_dp: 40.555
Correlation: 0.906
Perc_diff_means: 0.8
AL pct - (Daughter 1)
AL pct - (Parent)


Scatter Plot in Log Scale (AL_pct)
x=y
AL pct - (Daughter 1)
AL pct - (Parent)


Parent Vs Daughter 3: Q-Q Plot (FE_pct)
Percentiles
Count of pairs: 308
Mean_or: 20.565
Mean_dp: 20.154
Max_or: 66.182
Max_dp: 60.052
Min_or: 0.25
Min_dp: 1.346
Median_or: 17.646
Median_dp: 16.831
Q3_or: 31.081
Q3_dp: 30.735
Std_or: 13.649
Std_dp: 13.399
CoefVar_or: 66.367
CoefVar_dp: 66.482
Correlation: 0.961
Perc_diff_means: -2.0
FE pct - (Daughter 3)
FE pct - (Parent)

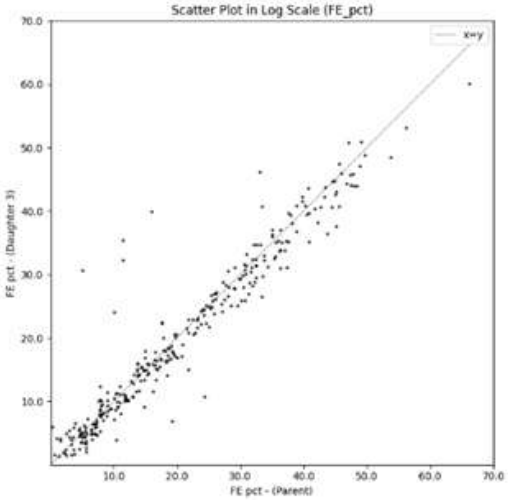
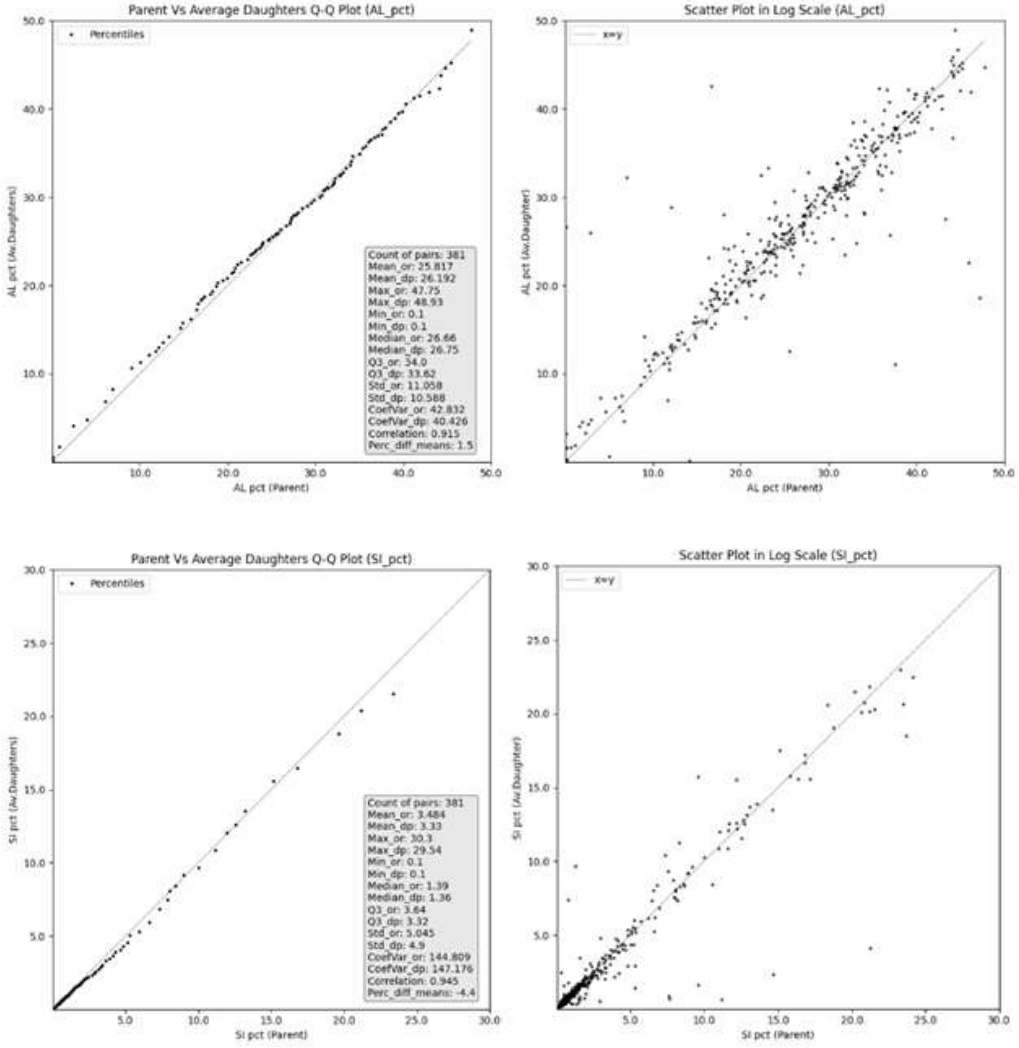
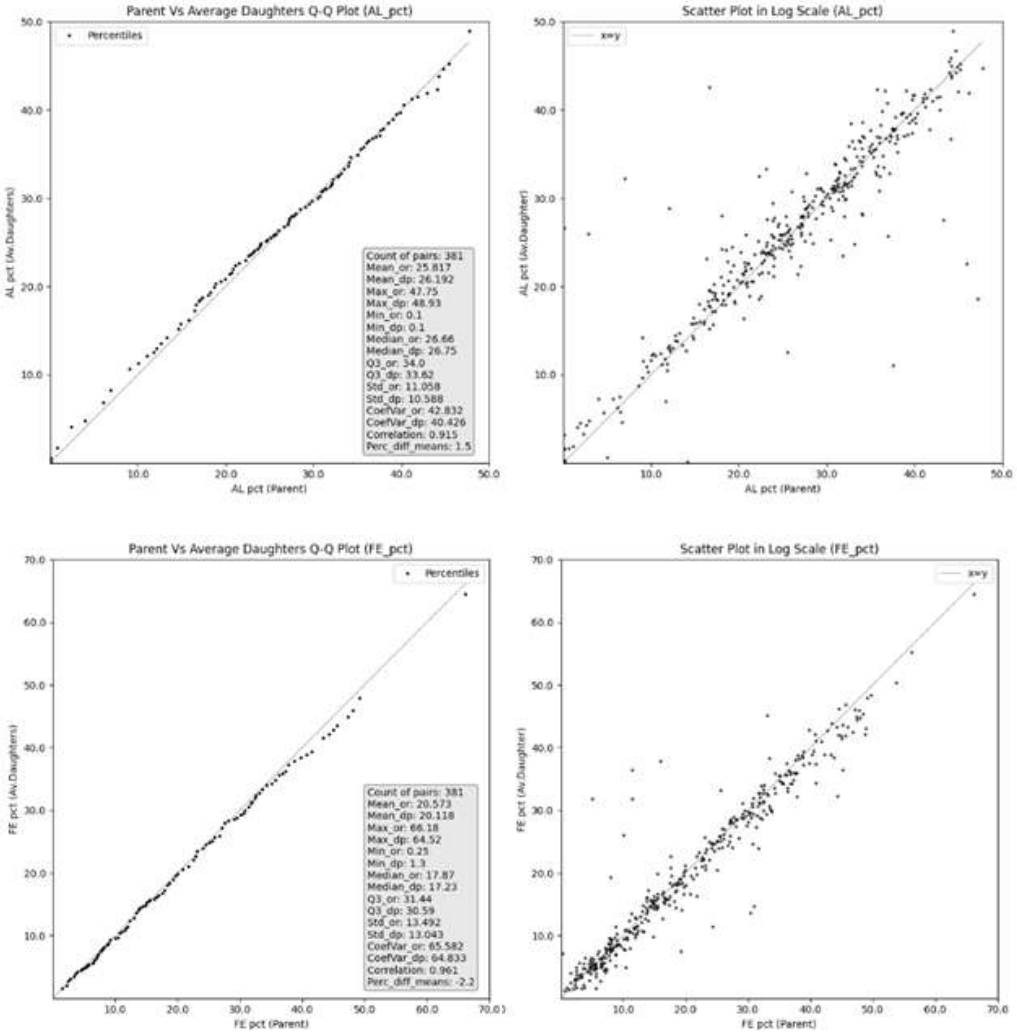

Scatter Plot in Log Scale (FE_pct)
x=y
FE pct - (Daughter 3)
FE pct - (Parent)

Figure 8-14: Quantile-Quantile Plot (on the left) and Scatter Plots (on the right) of Parent and Average of Daughters' Analysis of AL, SI and FE





8.4.4.5 Holyoake Program

In 2022, SLR undertook a comprehensive re-evaluation of historic assays to monitor the quality of historical data and guide daily production. A total of 33,224 historic and recent assays were provided, which were refined to produce 15,412 perfectly matched pairs. The QP conducted an analysis comparing the original historic FTIR available alumina (AL) and reactive silica (SI) assays with recent Holyoake duplicate assay results. Alcoa implemented the Holyoake check assay in 2021.

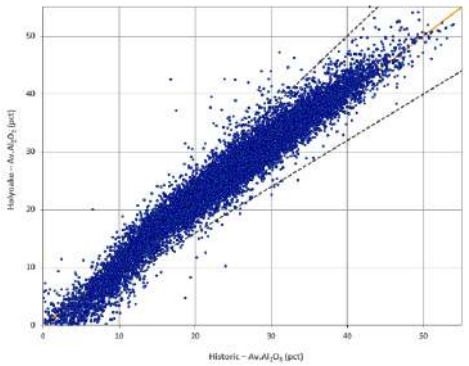
The analysis revealed that recent AL values are significantly higher above the 10% grade, indicating a clear high bias. Conversely, values below 10% showed a low bias, often exceeding an acceptable 20% difference limit. Similarly, SI values exhibited a low bias between grades of

0 and 5%, and a strong high bias for values above 5%. The percent differences between the means were notably high for both analytes, at 5.3% for AL and 13.5% for SI. These trends are illustrated in Figure 8-15, and Figure 8-16.

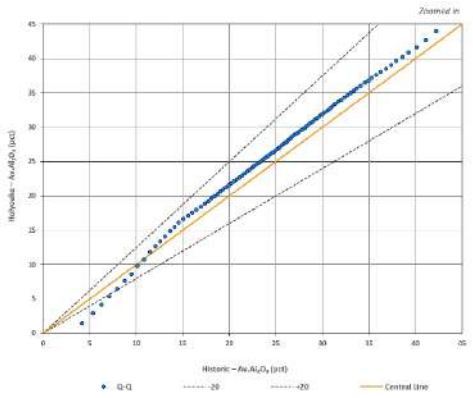
These discrepancies likely result from improvements in analytical methods and procedures since 2005, reflecting a better geochemical understanding of the deposit. SLR recommended addressing these biases by limiting the use of historic data where possible and continuing the re-assay program for assays collected before 2005.

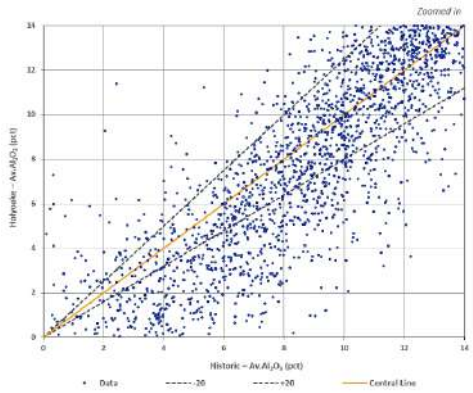
Figure 8-15: Scatter Plot, Quantile-Quantile Plot and Statistics of AL Historic and Holyoake Results.

Scatter Plot – AL



Quantile-Quantile Plot – AL

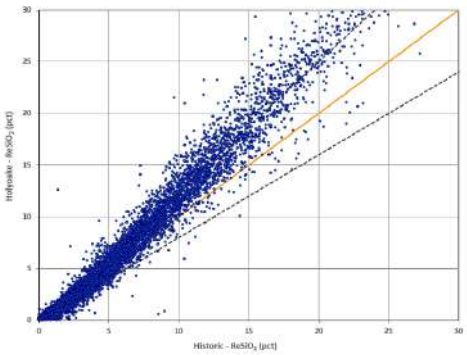




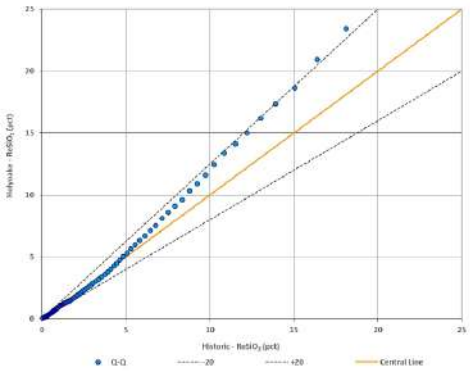
	Original	Duplicate
Number of Samples (N):	15,412	15,412
Mean (%):	23.71	24.96
Maximum Value (%):	59.00	58.60
Minimum Value (%):	-4.09	-2.08
Median (%):	24.46	26.10
Variance:	101.39	120.83
Std. Dev:	10.07	10.99
Co-ef. Variation:	0.42	0.44
Correlation Coefficient	0.975	
%Difference Between Means	-5.3%	

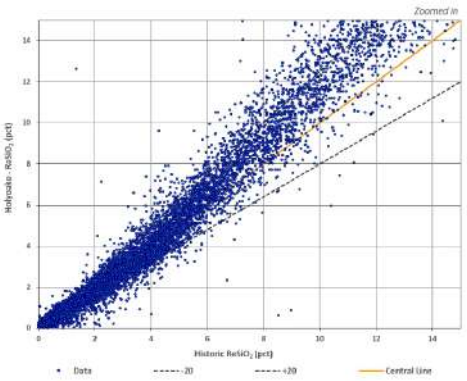
Figure 8-16: Scatter Plot, Quantile-Quantile Plot and Statistics of SI Historic and Holyoake Results.

Scatter Plot – SI



Quantile-Quantile Plot – SI





	Original	Duplicate
Number of Samples (N):	15,412	15,412
Mean (%):	3.65	4.14
Maximum Value (%):	34.55	42.96
Minimum Value (%):	-0.92	-0.13
Median (%):	1.64	1.48
Variance:	21.37	34.71
Std. Dev:	4.62	5.89
Co-ef. Variation:	1.27	1.42
Correlation Coefficient	0.987	
% Difference Between Means	-13.5%	

8.4.4.6 Stockpile Feed and Sampling

Refinery feed grade is monitored at Huntly and Willowdale using material collected at the Pinjarra and Wagerup sample plants. At each operation, the sample plants are located at the refinery end of the overland conveyors, just prior to the stockpile stackers.

The stockpile area at the Pinjarra refinery is fed by two conveyor belts (SP-171 and SP-271) that derive their ore from the same crusher (currently at Myara). Prior to the ore being combined from the belts and fed to the stockpile area, it passes through a sampling tower that alternatively takes a primary cut from each belt, dries, crushes, subsamples and combines them into two parallel samples for 12-hour shifts.

A comparison of these paired samples (SLR, 2022) found no material issues and no new data was presented for this review.

8.5 Conclusions

The SLR QP is of the opinion that the data reviewed from November 2023 to September 2024, along with the protocols in place for ensuring accuracy and precision, provide sufficient confidence in the reliability of the data used for resource estimation. Sample and data security protocols adhere to the best industry standards.

In particular:

- The current use of internal standards provides a robust framework for ensuring the precision and accuracy of assay data through continuous adjustments. The QP recommends investigating the cause of the negative bias observed in available alumina results from batches P205 and P206 of the IRM KH20, which occurred between February and March 2024, to prevent future occurrences. Additionally, it is advised to continue monitoring failures and recurrent trending biases that might adversely affect the Mineral Resources estimate.
- The regular external checks performed by Bureau Veritas have ensured the reproducibility of the Bella lab results, with no significant biases observed in this review.
- The STE method effectively represents the drill interval grade, comparable to collecting the entire residue and performing pulverizing, homogenization, and splitting. Despite the efficacy of the STE process, the QP recommends considering the reintroduction of field duplicates using appropriate riffle splitters for additional validation of the sampling process.

It is the opinion of the QP that the sample preparation, security, and analytical procedures used for the Alcoa Mineral Resource meet conventional industry practice and are adequate to allow provision of data included in this Mineral Resource estimate. FTIR is not widely used yet in the bauxite industry but is becoming more widely accepted and applied at more operations. At Alcoa, the method has been consistently applied successfully for a decade and is routinely validated by industry standard XRF and wet chemical procedures as discussed in Sections 8.3 and 8.4.

It is the opinion of the SLR QP that, from the studies on FTIR repeatability discussed above, the overall precision and accuracy of the FTIR assaying is acceptable and adequate for use in a Mineral Resource estimate.

9.0 Data Verification

9.1 Data Structures

Wherever possible the transfer of geological, sampling and assaying data is now carried out digitally.

The use of rugged field tablets was introduced after an external review (Snowden, 2015). The data recorded at the drill rig is uploaded daily via WiFi for validation prior to importing into the acQuire database. This allows the data to be captured, checked, approved, and then loaded without any further manual keystroke entry.

The sample preparation and assaying data are all recorded at the Bella facility (see Figure 8-3) allowing all aspects of the sample preparation to be tracked and transferred to KWI through direct connection to their Laboratory Information Management System (LIMS). After calibration, validation and checking of the FTIR and REF assays they are transferred digitally to the acQuire database.

Within the database, scripts are run to prioritize the results and to define the BEST value for each analyte (e.g. AL_BEST, SI_BEST, etc.). The downhole accumulations of all grades are calculated, and the base of mineralization is determined. Other values are also calculated such as the Density using a regression equation (see Section 11.9.5).

An events table is used to change the status of each hole at all stages as it progresses through the validation process from designed, to drilled, to dispatched, to lab pending, to validated.

The various downhole geological features (LithCode, Seam, Geol Floor, etc.) are all verified spatially, validated by geologists using the vertical position and assays (e.g. Figure 7-6), and where appropriate metadata (e.g. Status Flag) is added to record the basis of the interpretation.

The required modelling files are exported from the acQuire database by the geostatisticians using queries. The final Mineral Resource models are then imported into the over-arching ArcMap environment for mine planning, and integration with the environmental and other planning protocols.

Figure 9-1: Visual Display of Hole Status (logged and assayed) for Hole G39150224 in Serpentine (Alcoa, 2021)

9.2 Data Verification Measures

The QP interrogated the data extracted from the acQuire database for two areas (Serpentine and Millars). For these two areas, the count of records in each table is summarized in Table 9-1.

Table 9-1: Count of Records by Database Table for Two Database Extracts

Data Type	Table	Serpentine	Millars
Collars	*tblass*	6,362	8,298
Surveys	*tblsur*	6,362	8,298
Assays	*tblass*	59,622	70,905
REF Assays	*tblassrefs*	611	711
Lithology	*tblgeoLithology*	69,564	82,762
Geology Floor	*tblgeoGeolFloor*	69,561	82,761
Seam	*tblgeoSeam*	69,564	82,762

Extensive checks were run to validate the integrity. These included searching for duplicate records, downhole gaps¸ interval overlaps, missing collar or survey records, etc.

The following observations were made:

- As expected, the Validation Tables ensure that there are no anomalous codes.
- Checks for assay closure (adding all assays to 100%) are done by Alcoa when the assay data is prepared for resource estimation. The availability of total oxide assays (e.g. AT and ST) has progressively increased over time.
- In a few cases (156 for Serpentine, drilled from October 2019 to December 2019, and 114 for Millars) there were blank values for LithCode in the table geoLithology at the top of the hole, followed by a zero-length interval (e.g. From 1.2 m and To 1.2 m) with a valid LithCode. This is due to the practice of not sampling the overburden but instead discarding it, creating in some cases a short interval with no assay or LithCode. This type of database error is usually picked up by a validation check looking for zero length drill segments. In this deposit, because the geological logging is expected to follow a vertical sequence (which is used for some of the interpretation scripts), such zero length intervals are not uncommon to allow for pinching and swelling of some horizons.

Some calculation and range checks were run that highlighted gaps or anomalies in the scripts used to validate that data before resource estimation:

- There are 19 records with ST_BEST values greater than 100% in Serpentine and 2 in Millars. Such values should be investigated, trimmed, and flagged.
- There are a number of records (107 for Serpentine and 165 for Millars) where AL (available alumina) is greater than AT (total alumina). There are also records (1,273 for Serpentine and 2,029 for Millars) where SI (reactive silica) is greater than ST (total silica). These should be further investigated, flagged in the database, and future instances flagged during data loading so that when such results (infrequently) occur there is recognition during the data loading that this is due to FTIR assays outside the normal calibration range, rather than due to sample mix-up or contamination.

- Checks on the regression calculation for density were run on the Serpentine database. There were 1,187 records not flagged as Seam=CAP, that had density values ranging from 2.04 to 2.28. These were either 20% or 40% CAP and had a density value reflecting the length weighted average of the two domains assigned. Of the total 6,399 records with valid seam and iron data, SLR found that 5,566 (87%) were within ±0.1 of the database density value. The remaining 833 records with Seam=CAP and an FE_BEST assay were either 60% or 80% CAP and had a density value reflecting the length weighted average of the two domains assigned.

9.3 QP Opinion

The database extracts that were provided proved very robust to scrutiny, except for a small number of anomalies noted, none of which are considered material in view of the vast number of drill holes, assays, and other records.

The QP is of the opinion that the database is adequate, and the data is appropriate for the purpose of Mineral Resource estimation.

10.0 Mineral Processing and Metallurgical Testing

Mineral processing and metallurgical test work samples representing the entirety of the Darling Range operations are not available. However, as an operating mine the resource classification is upgraded to measured well before extraction, with samples and test work conducted as part of these operations to confirm process suitability and compliance defining Reserves. SLR has reviewed the available resource data to confirm that this operating data aligns with the LOM schedule for material to be mined over the next nine years. This material is sourced from four mining regions, representing the various types and styles of mineralization within the Darling Range operations.

It is important to note that there is no upgrading involved in the processing and therefore the processing recovery can be considered above 99% allowing for any losses in production.

The operating data between 2010 to September 2024 for the Willowdale operation and 2010 to September 2024 for the Huntly operations indicates that the product from the Darling Range operations consisted of an average AL grade of 33% and average Total SiO_2 grade of 20%. It is important to note that higher grades of SI are potentially deleterious (in that they would increase the refinery cost) but that it has remained below 1.31% throughout the 14 years of operation with the recent increase associated with the reduction in available bauxite stocks in the current mining regions. SLR understands that according to the long term mine plan on an annual basis the Total SiO_2 content marginally increases towards 23% over the next three years, and then for the remainder returns to averages of 22.5%. The SI, on the same basis, remains at or below 1.8% (for the combined mine output) both in the short term and over the remaining period of the next nine years. This means there is no evidence of any problematic deleterious elements present in the Darling Range ore within the next nine years of production.

A summary of the product grades from the Darling Range operations are shown in Table 10-1, Table 10-2, and Table 10-3.

Table 10-1: Product Grades of Darling Range Operation (Willowdale–Wagerup refinery feed)

Year	Moisture (%)	LOI (%)	Total Al_2O_3 (%)	Total SiO_2 (%)	Fe_2O_3 (%)	TiO_2 (%)	AL (%)	SI (%)
2010	8.0	22.3	38.1	21.8	17.5	1.43	32.8	1.13
2011	7.9	20.9	40.6	22.3	17.6	1.47	32.8	1.14
2012	8.0	21.0	38.1	21.1	18.1	1.58	33.0	1.16
2013	7.7	21.2	36.8	18.6	19.5	1.61	32.7	1.21
2014	7.9	21.2	37.2	18.1	19.3	1.62	33.1	1.17
2015	7.5	21.5	37.0	18.0	19.0	1.72	33.2	1.11
2016	7.8	21.6	37.6	16.7	20.6	1.75	33.1	1.14
2017	7.8	21.8	37.9	16.0	21.4	1.83	33.0	1.10
2018	8.0	21.6	38.3	15.9	21.3	1.88	33.0	1.13
2019	7.6	21.3	37.3	16.8	21.3	1.85	32.3	1.15
2020	7.8	21.5	37.4	14.1	23.3	2.10	32.5	1.07
2021	8.3	21.5	37.5	18.0	21.0	1.73	32.4	1.06

2022	7.8	21.1	37.5	17.9	21.3	1.85	32.3	1.02
2023	7.8	20.6	36.8	18.8	21.5	1.80	31.6	1.04
2024*	8.0	19.1	34.0	23.2	21.1	1.81	28.4	2.00

** Data available to 30 September 2024*

Table 10-2: Product Grades of Darling Range Operations (Huntly–Pinjarra refinery feed)

Year	Moisture (%)	LOI (%)	Total Al_2O_3 (%)	Total SiO_2 (%)	Fe_2O_3 (%)	TiO_2 (%)	AL (%)	SI (%)
2010	7.4	20.8	38.6	20.8	17.4	1.34	33.1	1.05
2011	7.8	21.0	38.8	20.0	18.0	1.41	33.0	1.04
2012	8.2	21.4	39.4	20.2	17.1	1.37	33.6	1.13
2013	8.1	21.5	39.8	19.5	17.1	1.35	33.9	1.12
2014	8.2	21.5	39.6	18.6	17.7	1.45	33.8	1.16
2015	8.0	21.6	39.3	19.5	17.3	1.41	33.8	1.08
2016	8.2	21.4	39.2	20.3	17.0	1.38	33.8	1.13
2017	8.3	21.3	39.3	19.6	17.5	1.42	33.9	1.11
2018	8.3	21.4	39.1	19.5	17.6	1.42	33.7	1.07
2019	8.1	21.3	38.9	20.1	17.2	1.38	33.5	1.12
2020	8.4	21.4	39.1	18.4	18.6	1.52	33.5	1.20
2021	8.9	21.1	38.8	19.7	18.3	1.48	33.0	1.24
2022	8.5	20.8	37.9	19.3	19.9	1.62	31.9	1.31
2023	9.1	19.7	35.6	20.0	21.9	1.84	29.6	1.64
2024*	9.3	18.9	33.9	22.9	20.5	1.78	28.5	2.19

* Data available to 30 September 2024

Table 10-3: Product Grades of Darling Range Operations (Huntly–Kwinana refinery feed)

Year	Moisture (%)	LOI (%)	Total Al_2O_3 (%)	Total SiO_2 (%)	Fe_2O_3 (%)	TiO_2 (%)	AL (%)	SI (%)
2006	7.8	21.7	39.3	18.7	18.0	1.37	33.9	1.10
2007	8.0	21.6	39.2	19.5	17.6	1.33	33.7	1.11
2008	7.9	21.3	39.1	20.1	17.3	1.34	33.8	1.09
2009	7.8	21.3	39.0	20.7	17.3	1.29	33.5	1.02
2010	7.5	21.4	38.6	20.8	17.4	1.26	33.1	1.04
2011	7.6	21.3	38.7	20.1	18.2	1.30	32.8	1.03
2012	8.2	21.5	39.4	20.3	17.0	1.25	33.5	1.13
2013	8.1	21.8	39.8	19.5	17.1	1.26	33.9	1.11
2014	8.2	22.0	39.6	18.8	17.7	1.37	33.7	1.17
2015	8.0	22.0	39.4	19.7	17.2	1.31	33.8	1.08

2016	8.2	21.7	39.1	21.3	16.1	1.32	33.8	1.03
2017	8.3	22.2	38.9	20.6	16.5	1.34	33.8	1.03
2018	8.3	22.1	38.6	20.8	16.7	1.33	33.9	1.05
2019	8.0	21.8	38.9	21.2	16.4	1.32	33.5	1.12
2020	8.4	21.7	39.1	19.8	17.6	1.44	33.5	1.16
2021	8.9	21.0	38.7	20.9	17.6	1.39	33.0	1.20
2022	8.5	20.8	37.6	20.7	18.6	1.50	31.9	1.26
2023	9.1	20.0	35.8	21.2	20.6	1.76	29.6	1.61
2024*	8.0	19.0	34.6	24.5	19.6	1.70	28.1	2.33

** Data available to 30 April 2024*

10.1 QP Opinion

SLR is of the opinion that the Darling Range operation demonstrates that ore can be effectively crushed and supplied to a refinery for further upgrading to produce Alumina. The historical operational data confirms that the ore consistently meets refinery specifications without any deleterious elements. Based on this, and the additional information about the mine plan provided by Alcoa, it is reasonable to assume that the ore from Darling Range can be economically processed for the next nine years.

11.0 Mineral Resource Estimates

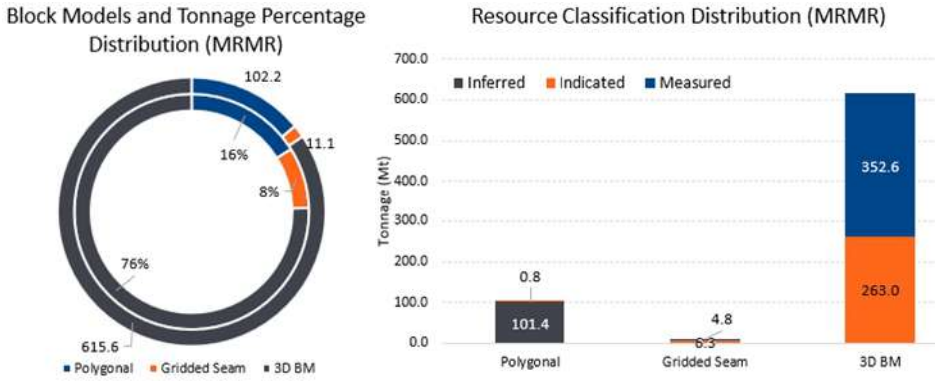
11.1 Summary

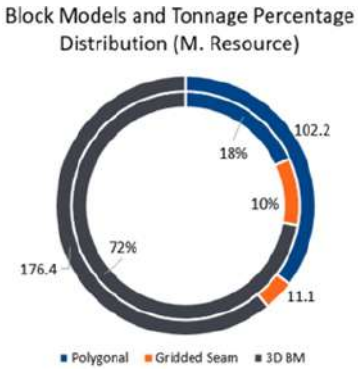
The Darling Range resource comprises over 20,000 resource blocks, with a combined area of approximately 10,250 ha, averaging 30 kt of Mineral Resource per block. The lateritic bauxites occur as surficial coverings of limited thickness, typically between 4 m to 8 m, but with significant lateral extent. Historically, resource estimation was by 2D plan-polygonal methods (Polygonal) referred to by Alcoa informally as the ResTag procedure. More recently, resource estimation by Alcoa has evolved to include gridded seam (GSM) and 3D block (3DBM) models using geostatistical techniques. Mineral Resource estimates based on GSM and 3DBM models (and some Polygonal models) consider practical mining constraints.

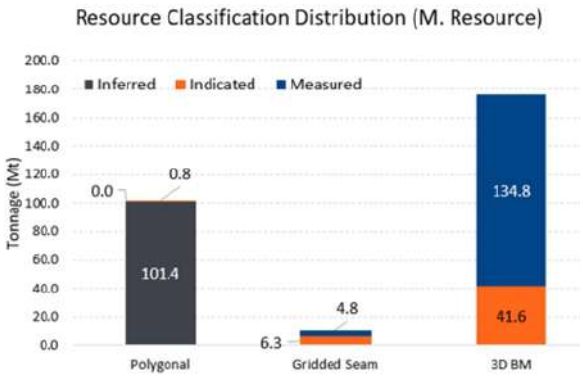
The delineation of Mineral Resources using 3D methods has focused on well drilled areas that fall within the nine-year mine plan. Approximately 82% of the total tonnage, including Mineral Resources and Mineral Reserves (MRMR), of the Darling Range project is already in 3D block models. GSM models were typically constructed in areas with 15 m spaced drilling, which comprises 10 models. Approximately 34% of the Mineral Resources are based on Polygonal (ResTag) estimates which are mostly located in areas of wider-spaced (30 m and 60 m) drilling and are of lower confidence. All new resource updates employ the 3DBM methods irrespective of drill hole spacing.

Figure 11-1 illustrates the tonnages and number of models for each model type that are being discussed in this section.

Figure 11-1: Circle Charts Showing the Tonnage in Mt (external circle) and Number of Models (internal Circle) and Bar Charts Showing the Tonnage by Mineral Resource Categories







Charts on the top refer to all the tonnage of the Darling Range project, and on the bottom to the exclusive Mineral Resources

Mineral Resource estimation was carried out by Alcoa and resources are defined for 92 sheets in 70 mining regions. There are 13,467 discrete zones of mineralization that comprise the resource, each split vertically into 4 domains for which 11 elements were estimated. SLR carried out audits on representative models selected in conjunction with Alcoa and comprising:

- Models to be mined in the short to medium term (less than 5 years)
- Models with significant amounts of resource material
- Models representing the three estimation methods used by Alcoa.

The models audited were:

- ResTag estimation method: Teesdale
- GSM estimation method: Larego (F54 and F55)
- 3DBM estimation method: Myara North M25, M22, M23, and Holyoake H12.

The audit process by SLR comprised examination of the procedures used by Alcoa, independent review, discussion with staff, and normal validation checks (e.g., global statistics, swath plots, visual examination, and change of support analysis). M23 and H12 were the focus of the 2023 work, while R25 and R22 were reviewed in detail in the previous years.

The process used by Alcoa involves an integrated approach to data collection, bauxite delineation, and production planning aimed at the provision of feedstock that meets the requirements of the local alumina refineries.

For all 3 estimation methods drill holes were flagged with geological units using multi-pass geochemical scripts that included thickness constraints. The GSM flagging process incorporated some additional mining constraints. Geological interpretations in both 2D and 3D were constructed with the flagged drill hole composite data, which constrain the spatial estimation of bauxite mineralization. Subsequent to block grade estimation, mining constraints are applied to the 3DBM models to restrict Mineral Resources to areas of potentially economic bauxite mineralization.

AL, SI, FE, ST, PT, OX, EO, CO, and SU are estimated for all models, but only AL and SI are reported for the Mineral Resource. GSM uses inverse distance weighting methods to assign grades to the bauxite profile, and 3DBMs rely on ordinary kriging block grade estimates. Validation methods differ slightly for the different model types, but all models are reported by Alcoa to validate well against the input drill hole data.

Mineral Resources have been classified in accordance with the definitions for Mineral Resources in S-K 1300, which are consistent with Australasian JORC Code (2012) and Canadian Institute of Mining Metallurgy and Petroleum (CIM) (2014) definitions in NI 43-101 and are determined primarily on drill hole spacing. Models constructed primarily with pre-2010 drill holes are downgraded as this information is considered to be of lower confidence.

Mineral Resource estimates exclusive of Mineral Reserves Darling Range deposit are shown in Table 11-1, and include a 5% reduction factor in tonnage, based on the results of annual reconciliations (see discussion on density in Section 11.14).

Table 11-1: Summary of Darling Range Mineral Resources exclusive of Mineral Reserves – 31 December 2024

Category	Tonnage (Mt)	AL (%)	SI (%)
Measured	139.6	30.4	1.77
Indicated	48.7	30.3	1.42
Measured + Indicated	**188.4**	**30.4**	**1.68**
Inferred	101.4	32.4	1.20

Notes:

1. *The definitions for Mineral Resources in S-K 1300 were followed, which are consistent with JORC (2012) definitions.*
2. *Mineral Resources are 100% attributable to Alcoa.*
3. *Mineral Resources for the polygonal models are estimated at a geological cut-off grade, which generally approximates to nominal cut-off grades of 27.5% available alumina (AL) with less than 3.5% reactive silica (SI). Locally the cut-off grade may vary, depending on operating costs and ore quality for blending.*
4. *Mineral Resources were estimated using an alumina LOM price of $500/t and a caustic soda LOM price of $300/t.*
5. *A minimum total mining thickness of 1.5 m was used.*
6. *In situ dry bulk density is variable and is defined for each block in the Mineral Resource model.*
7. *A global downwards adjustment of tonnes by 5% is made to account for density differences based on historic mining performance.*
8. *Mineral Resources are reported exclusive of Mineral Reserves.*
9. *The reference point for the Mineral Resource is the in situ predicted dry tonnage and grade of material to be delivered to the refinery stockpile following the application of Mineral Resource pit.*
10. *Metallurgical recovery has not been directly considered in the estimation of Mineral Resources as the Darling Range operations do not include a conventional processing plant, only crushing as described in Section 14.0. The metallurgical recovery of the refineries (Pinjarra and Wagerup) are beyond the boundaries of the mining operations being the subject of the TRS.*
11. *Numbers may not add due to rounding.*

11.2 Comparison with Previous Estimate

A comparison of the current Alcoa Mineral Resource estimate, exclusive of Mineral Reserves, to the previous 2023 Mineral Resource estimate is presented in Table 11-2.

Overall, the Measured and Indicated resources decreased 10.1 Mt (-5%), from 198.4 to 188.4 Mt, while the Inferred resource decreased 5.5 Mt (-5%), from 106.9 to 101.4 Mt.

The decreases are primarily due to the following changes:

- Optimization of the Mineral Resources and Mineral Reserves considering the base alumina and caustic soda prices

- Migration from Mineral Resources to Mineral Reserves due to mine scheduling changes

Partially offset by:

- Deferred mining of the RPZ
- Continuous mineral exploration activities (for Resource expansion).

Table 11-2: Comparison with Previous Mineral Resource Estimates

Category	Mine	2024 Mineral Resource			2023 Mineral Resource			Difference (%)		
		Tonnage (Mt)	AL (%)	SI (%)	Tonnage (Mt)	AL (%)	SI (%)	Tonnage	AL	SI
Measured	Huntly	106.1	30.4	1.89	51.5	30.5	1.62	106%	0%	17%
	North	0.0	0.0	0.00	0.0	0.0	0.00	---	---	---
	Willowdale	33.5	30.4	1.39	41.5	30.4	1.39	-19%	0%	0%
	Sub-total	**139.6**	**30.4**	**1.8**	**93.0**	**30.4**	**1.52**	50%	0%	17%
Indicated	Huntly	40.7	30.3	1.46	66.3	31.0	1.50	-39%	-2%	-2%
	North	0.8	32.3	1.38	0.8	32.3	1.38	0%	0%	0%
	Willowdale	7.2	29.9	1.16	38.3	30.4	1.05	-81%	-2%	10%
	Sub-total	**48.7**	**30.3**	**1.42**	**105.4**	**30.8**	**1.34**	-54%	-1%	6%
Measured + Indicated	Huntly	146.9	30.4	1.8	117.7	30.8	1.55	25%	-1%	14%
	North	0.8	32.3	1.38	0.8	32.3	1.38	0%	0%	0%
	Willowdale	40.7	30.3	1.35	79.8	30.4	1.23	-49%	0%	10%
	Sub-total	**188.4**	**30.4**	**1.68**	**198.4**	**30.6**	**1.42**	-5%	-1%	18%
Inferred	Huntly	9.0	35.7	1.25	11.2	34.4	1.35	-19%	4%	-8%
	North	15.1	31.6	1.00	15.1	31.6	1.00	0%	0%	0%
	Willowdale	77.3	32.2	1.24	80.6	32.2	1.24	-4%	0%	0%
	Sub-total	**101.4**	**32.4**	**1.2**	**106.9**	**32.3**	**1.22**	-5%	0%	-1%

11.3 Resource Database

11.3.1 Drill Hole Data

Drill hole collar, survey, and assay data are exported from the acQuire database for resource estimation.

Data exports from acQuire currently utilize Python scripts and the Spyder open-source plugin for validation and initial processing, including:

- Removing holes where drill hole intervals lack AL, SI, and FE assays
- Removing holes from the database if located greater than 7 m horizontally from the planned location
- Identifying and removing duplicate or repeat holes based on a set of criteria
- Resetting AT to AL where AL exceeds AT
- Where SI exceeds ST, resetting SI to ST if ST is greater than 15%, otherwise reset ST to SI
- Calculating Assay Total = AT (AL if AT absent) + ST + FE + PT + (SU/17.74) + 2
- Deleting assays for samples where the Assay Total is below 70% or greater than 100%.

The output is a set of CSV files for collar, survey, assay, and geology. The assay file contains a series of variables, including grades, cumulative grades, and historical domaining fields that are no longer used for the current geological modelling methodology. Table 11-3 shows the variables available in the assay output file.

Table 11-3: Variables in the assay table

Variable	Description	Variable	Description
Hole ID	Drill hole identification	**Cumulatives Date**	Date Cumulatives script was run
Project	Mining region	**BO_BEST**	Final bohemite AlO(OH) assay - based on DB priority, generally REF first then FTIR
Sample ID	Sample identification	**AL_BEST**	Final available alumina (AL) assay
From	Beginning of the sample	**EO_BEST**	Final extractable organic carbon (C) assay
To	End of the sample	**FE_BEST**	Final Fe_2O_3 assay
Seam	Profile unit - derived from logging. CAP from logged Cap depth then FRI derived from set of rules that determine the first clay sample beneath it	**MS_BEST**	Final magnetic susceptibility assay
Storage Status	Information of the sample's storage	**OX_BEST**	Final oxalate (NaC_2O_4) assay
Cumulative Density	Downhole cumulative density calculated in DB from top of CAP	**CO_BEST**	Final carbonate assay
Cumul_AL	Downhole cumulative AL calculated in DB from top of CAP	**SU_BEST**	Final sulphate (Na_2SO_4) assay
Cumul_AT	Downhole cumulative AT calculated in DB from top of CAP	**PT_BEST**	Final total phosphorus (P_2O_5) assay
Cumul_BO	Downhole cumulative BO calculated in DB from top of CAP	**SI_BEST**	Final reactive silica (SI) assay
Cumul_CO	Downhole cumulative CO calculated in DB from top of CAP	**ST_BEST**	Final total silica (SiO_2) assay
Cumul_EO	Downhole cumulative EO calculated in DB from top of CAP	**AT_BEST**	Final total alumina (Al_2O_3) assay
Cumul_FE	Downhole cumulative FE calculated in DB from top of CAP	**Density**	Density - calculated and stored as an assay - FE based algorithm for CAP otherwise 2. but are consistent with the values used other than for OVB and CLY

Cumul_MS	Downhole cumulative MS calculated in DB from top of CAP	**DOM1**	Levels of domain coding - Historical fields no longer used
Cumul_OX	Downhole cumulative OX calculated in DB from top of CAP	**DOM2**	
Cumul_PT	Downhole cumulative PT calculated in DB from top of CAP	**DOM3**	
Cumul_SI	Downhole cumulative SI calculated in DB from top of CAP	**DOM4**	
Cumul_ST	Downhole cumulative ST calculated in DB from top of CAP	**DOM5**	
Cumul_SU	Downhole cumulative SU calculated in DB from top of CAP	**DOM6**	
Cumulatives By	Whoever ran the script to calculate Cumulatives		

The validation checks have been implemented progressively over time as drill hole data for some project areas includes some samples where AL exceeds AT and SI exceeds ST.

Other than collar elevation adjustments, no further data transformations are applied prior to resource estimation.

A summary of the drillhole database is outlined in Figure 7-1.

Due to the large lateral extension of the project, SLR randomly selected two areas to be illustrated and detailed in the report, these being MYN-M23 (M23) and HLY-H12 (H12). Figure 11-2 illustrates the drilling in the M23 and H12 areas; Figure 11-3 and Figure 11-4 location of the M23 and H12 areas, respectively.

Figure 11-2: M23 and H12 area delimitation and drilling. The different colours represent the assay method used for each drilling phase

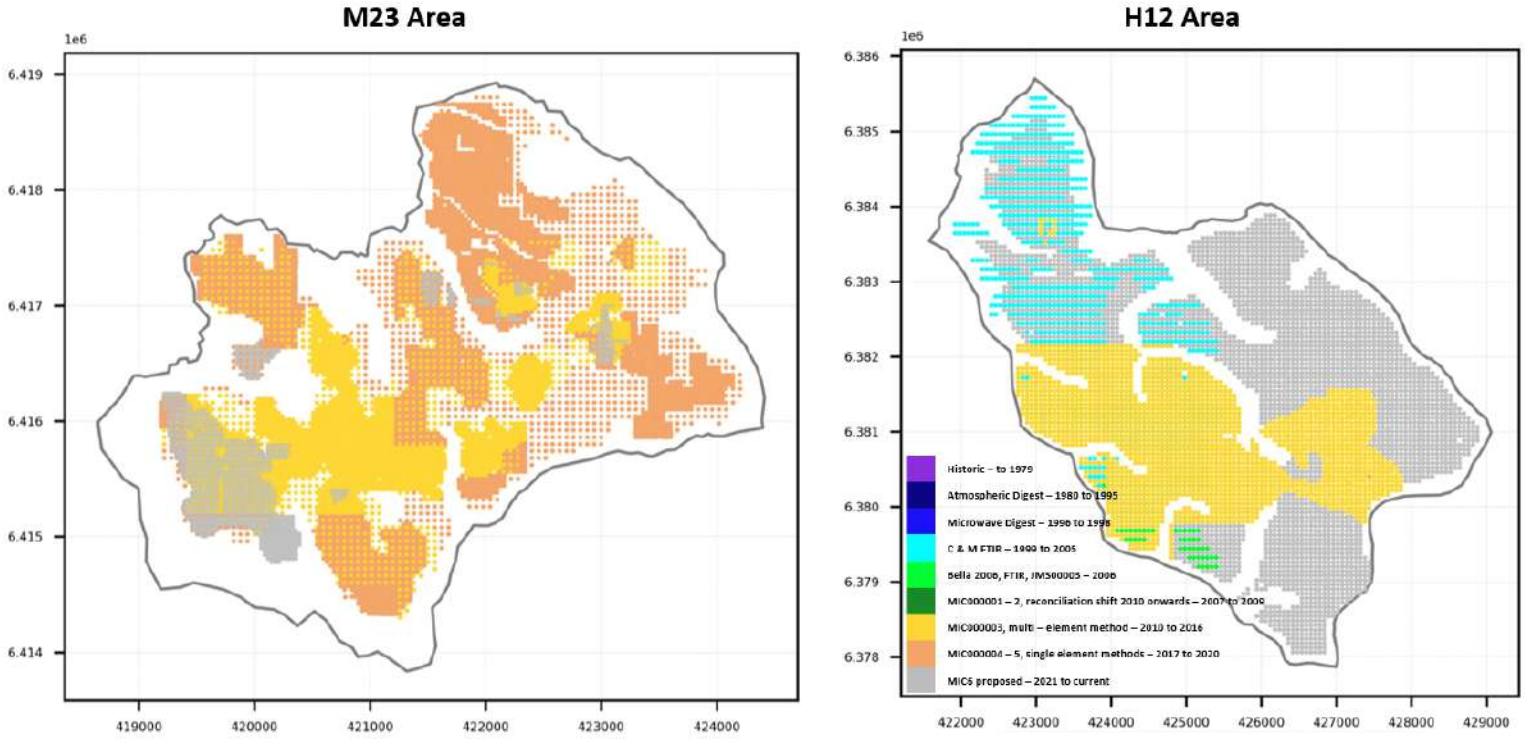


Figure 11-3: Location of the M23 Resource Model Area (MYN-M23)

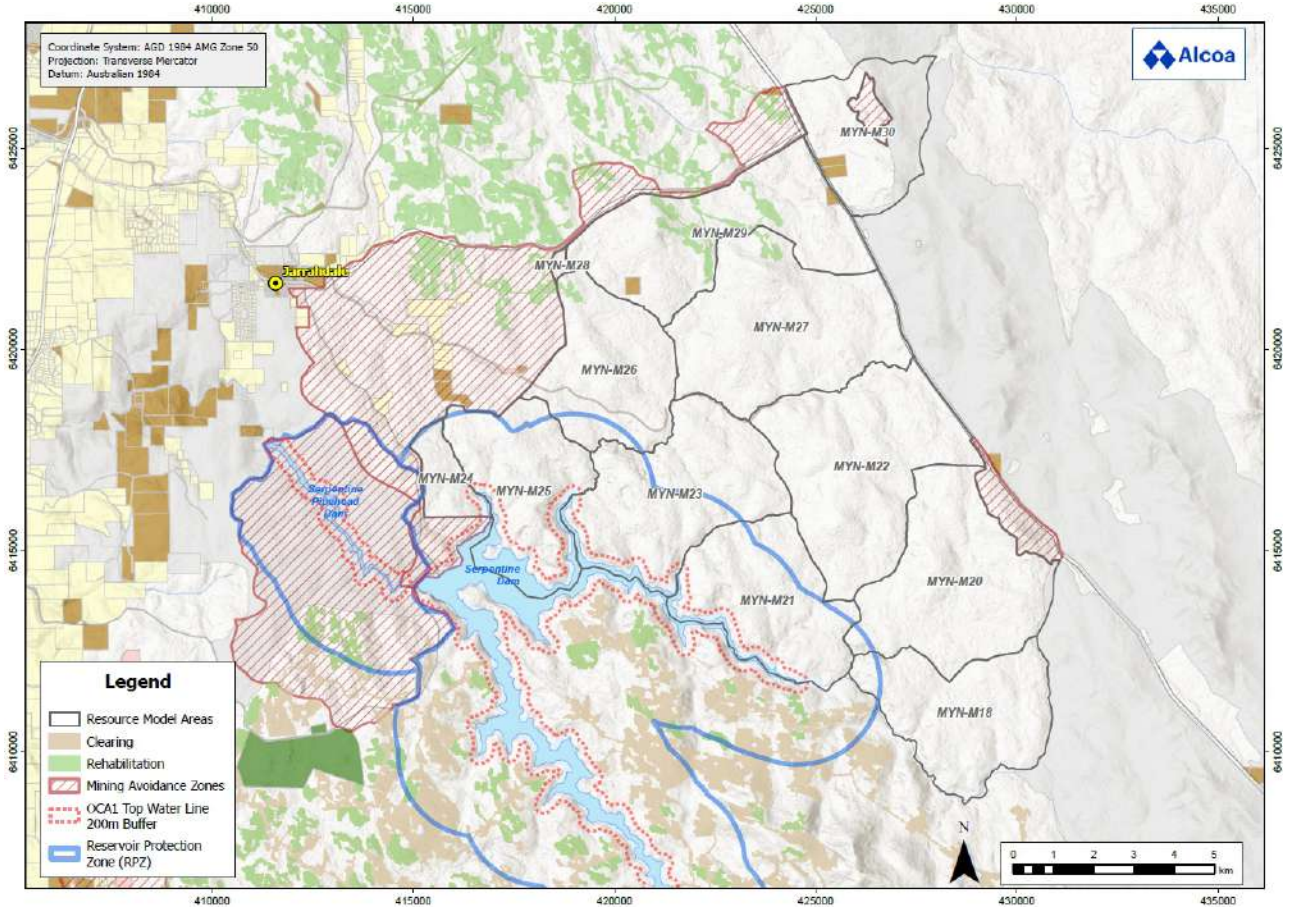
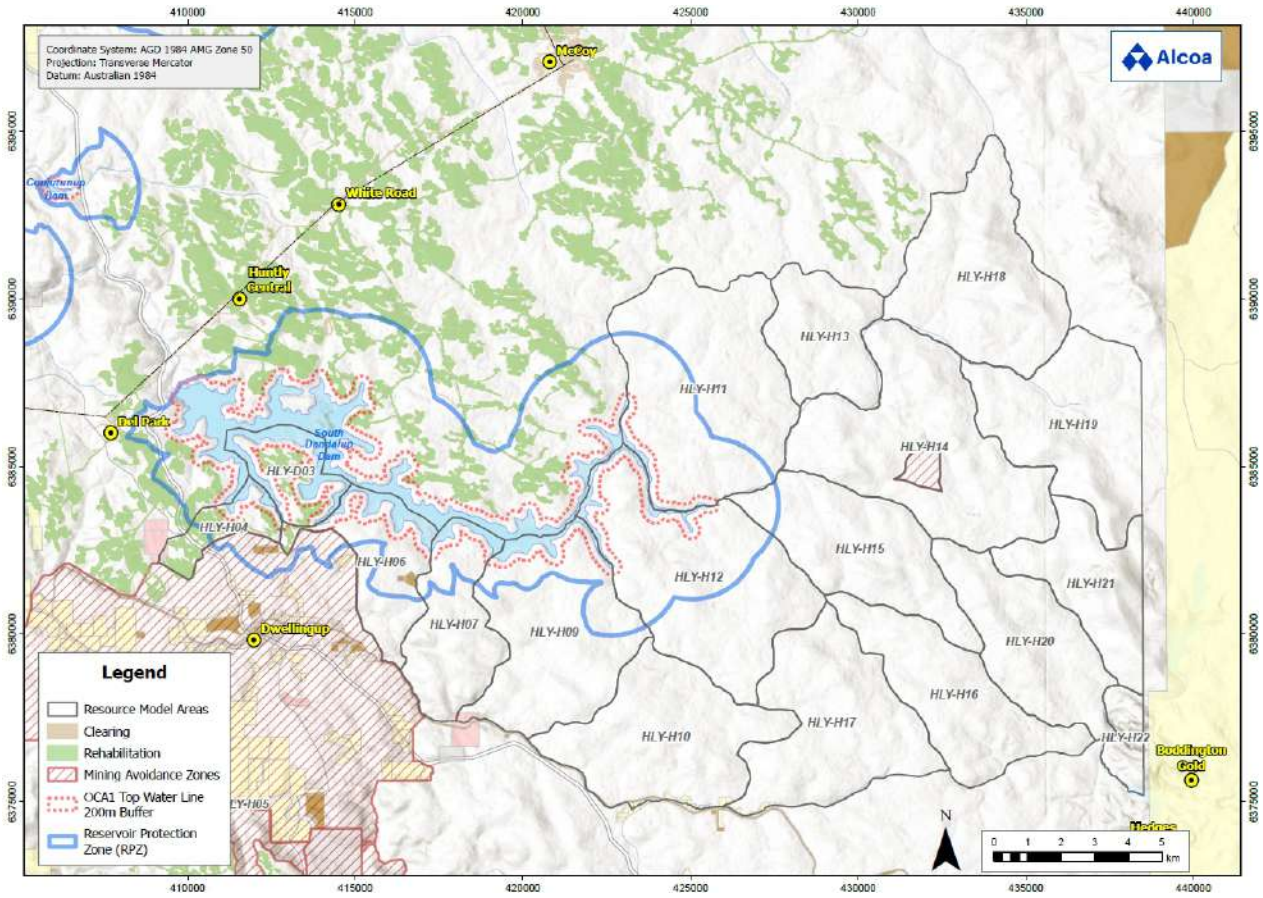


Figure 11-4: Location of the H12 Resource Model Area (HLY-H12)



11.3.2 Topographic Data

Digital elevations models (DEMs) were generated from (in order of priority) drill collar survey data, LiDAR survey data, and Landgate satellite data. A 7.5 m by 7.5 m mesh is used for the DEMs. Drill hole collar elevations were registered to the DEM for resource estimation.

11.4 Geological Interpretation

11.4.1 Polygonal Models

For Polygonal resource estimates, grade-based ‘geological’ codes are assigned to drill hole intervals. These codes are used to define the top and bottom of the ‘bauxite’ horizon in each hole, which is then used to estimate the bauxite volumes and average grades within polygons.

The top of the bauxite usually coincides with the base of the overburden, as defined in the drillers’ logs. The base of the Bauxite Zone (termed the geological floor) is defined within the acQuire database using a multi-pass script that applies the following hierarchical set of rules to the sample grades:

Pass 1:

- Uphole search for two consecutive samples with individual AL values ≥27.0%;
- Record depth of the lower of the two samples;
- Check that the cumulative AL at that depth is ≥27.5%;
- Check that the individual SI at that depth is ≤3.5%;
- Check that the cumulative SI at that depth is ≤3.0%;
- Check that the cumulative OX at that depth is ≤4 kg/t;
- Check that the sampled depth is ≥2.0 m, but less than hole depth (if equal, see pass 3);
- If all criteria are met, set flag to “pass”, set geological floor depth to lower sample depth; and
- Proceed to pass 2.

Pass 2:

- Uphole search for two consecutive samples with individual AL values ≥25.5%;
- Record depth of the lower of the two samples;
- Check that the cumulative AL at that depth is ≥27.5%;
- Check that the individual SI at that depth is ≤3.5%;
- Check that the cumulative SI at that depth is ≤3.0%;
- Check that the cumulative OX at that depth is ≤4 kg/t;
- Check that the sampled depth is ≥2.0 m, but less than hole depth (if equal, see Pass 3);
- If all criteria are met, set flag to “pass”, set geological floor depth to lower sample depth; and
- If any criteria fail, geological floor defined in Pass 1 is retained.

Pass 3:

- Uphole search for two consecutive samples with individual AL values ≥27.0%;
- Record depth of the lower of the two samples;
- Check that the cumulative AL at that depth is ≥27.5%;
- Check that the individual SI at that depth is ≤3.5%;
- Check that the cumulative SI at that depth is ≤3.0%;
- Check that the cumulative OX at that depth is ≤4 kg/t;
- Check that sampled depth = hole depth; and
- If all criteria are met, set flag to “pass – open”, set geological floor depth to lower sample depth.

Pass 4:

- Uphole search for two consecutive samples with individual AL values ≥24.5%;
- Record depth of the lower of the two samples;
- Check that the cumulative AL at that depth is ≥25.0%;
- Check that the individual SI at that depth is ≤3.5%;
- Check that the cumulative SI at that depth is ≤3.0%;
- Check that the cumulative OX at that depth is ≤4 kg/t;
- Check that the sampled depth is ≥2.0 m, but less than hole depth (if equal, see pass 3); and
- If all criteria are met, set flag to “marginal”, set geological floor depth to lower sample depth.

The application of these rules assigns a geological floor depth to each hole, along with a Pass, Pass-Open, Marginal, or Fail flag. Holes flagged as Marginal or Fail are inspected by Alcoa staff members, with manual adjustments applied if warranted. For areas infilled to 15 m spaced holes, the geological floor model is replaced by a mining floor model, which is discussed in the following section.

Results of geological floor flagging are used to subjectively define the lateral extents of the Mineral Resource. Outlines are manually interpreted by Alcoa geologists in ArcGIS or MineSight, and are guided by consistency in thickness, depth, and grade, minimum limits on the number of enclosed samples and the enclosed area, and local geomorphology. The polygons delineate separate areas that typically range in size from 10 ha to 100 ha, with most being around 30 ha. An example plan view is shown below in Figure 11-5.

Figure 11-5: Plan View of Polygonal Approach (Pass = red, pass open = green, marginal = yellow, fail = blue) (Alcoa, 2022)

11.4.2 Gridded Seam Models

GSM models are located in areas of 15 m spaced infill drilling and include practical mining constraints as part of the ‘geological’ interpretation used for resource models.

The base of overburden and the base of caprock is identified in each drill hole as 3D points and wireframed as surfaces. The geological bauxite zone floor, which is defined for the wider drill spacings used for Polygonal estimates, is replaced by a mining floor for GSMs. The mining floor is interpreted directly from the drill hole data presented on the 15 m spaced east-west cross sections, digitized in MineSight as strings, then linked to form wireframe surfaces.

The interpretation of the mining floor is a manual process performed by the site geologist, with the objective of achieving acceptable grades and practical mining outlines. The mining floors are defined using a set of guidelines instead of prescribed rules, including:

- Nominal cut-off grades of ≥27.5% AL and ≤3.5% SI are used for mining floor definition;
- If the SI grade in the sample immediately below the floor exceeds 5.0%, the floor is raised 0.5 m;
- A minimum face height (distance from mining floor to the base of overburden) is targeted;
- Face heights exceeding 4 m will require multiple cuts or bench mining;
- The overburden to face height ratio should not exceed 1;

- A maximum floor gradient of 1 in 7 is required between 15 m spaced holes (the gradient can be increased to 1 in 5 for second and third cuts);
- Benching should be invoked where the gradient constraints cannot be maintained; and
- The floor interpretations should be extended laterally into at least one of the surrounding waste holes.

The base of overburden and mining floor surfaces are used to flag the drill hole samples. For each drill hole, the samples located below the base of the overburden and above the mining floor are composited into a single interval, with composite grades length- and density-weighted. Additional drill hole composites are generated for second and third pass mining floors.

The composite data are examined in plan view, and polygons are digitized around the interpreted lateral extents of the mining zones using the following guidelines:

- Nominal cut-off grades of ≥27.5% AL and ≤3.5% SI for lateral boundary definition;
- The boundary is positioned at least 15 m away from holes with SI grades exceeding 5%;
- Buffer zones are placed around environmental constraints, and around bedrock outcrop;
- Internal waste zones should contain at least three drill holes;
- Individual polygons should have an area of at least 1 ha; and
- A width of at least 45 m should be retained for mining equipment movement.

The resulting polygons are divided into typically smaller ‘mining’ blocks that each contain approximately 20 kt to 40 kt of Mineral Resource.

11.4.3 3D Block Models

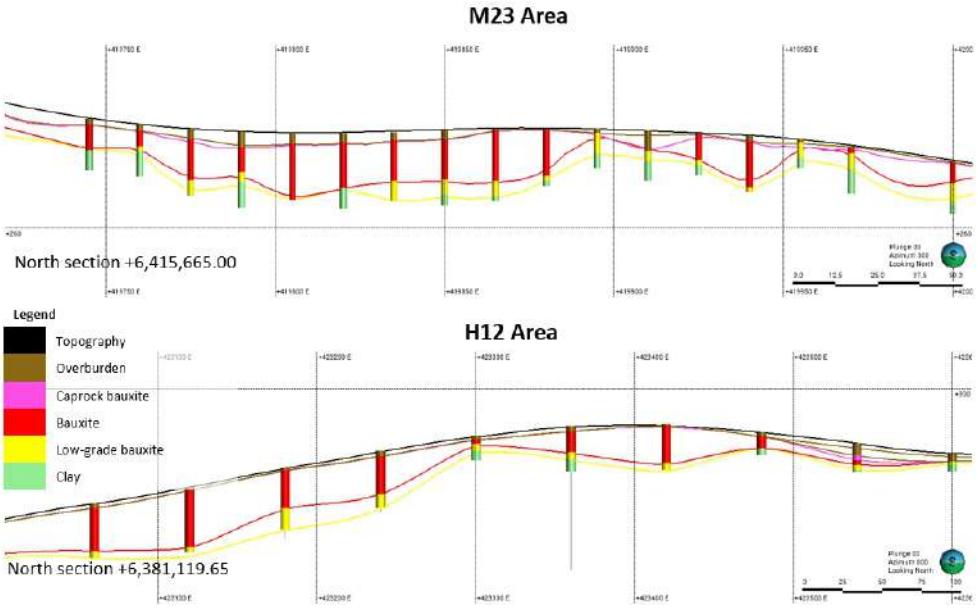
Similar to the Polygon and GSM interpretation approaches, a set of rules written in Python scripts are used to assign initial domain codes to individual samples. These domain codes are then modified in several subsequent passes that take into account the grades and coding of other intervals in the hole.

The initial script is used to assign a domain code to each interval based on various combinations of major analyte threshold grades. A total of six main material type domains (DOMAF) are defined:

- DOMAF = 99: overburden;
- DOMAF = 10: caprock waste;
- DOMAF = 20: caprock bauxite;
- DOMAF = 30: bauxite;
- DOMAF = 40: low-grade bauxite; and
- DOMAF = 50 clay.

Figure 11-6 illustrates an example of those domains in the M23 and H12 areas. Each of these material types (apart from overburden) is divided into up to five grade-based sub-domains. Three subsequent coding passes are conducted that iteratively adjust the codes to combine the sub-domain into the six main domains while ensuring that strict stratigraphic ordering is maintained. A further two passes are coded to assign domain codes that denote whether the material is derived from granite or dolerite.

Figure 11-6: Section Showing Domain (DOMAF) and the Main Wireframed Surfaces for the M23 (top) and H12 (bottom) areas– vertical scale 5x

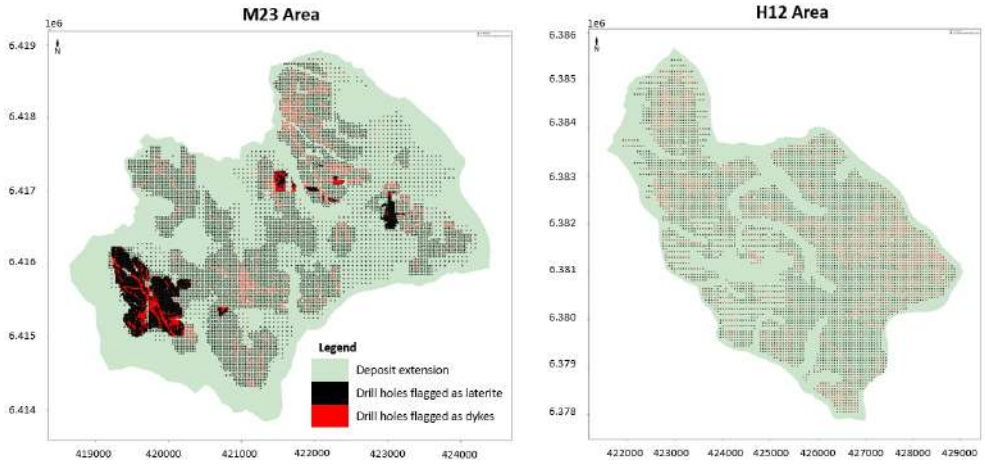


Source: SLR, 2023

The base of each Domain is generated on a 7.5 m by 7.5 m grid using an automated modelling process. To ensure a better fit of the wireframes, the elevation of some collars was adjusted to match the topography surface. Where drill holes do not penetrate the full bauxite profile or the domain contact is not properly defined due to missing assays, a conditional simulation algorithm is used to estimate the domain thickness from adjacent drill holes. The simulation algorithm employs a general variogram and selects the average of 10 simulations for the missing data point. The grid mesh is then wireframed in MineSight to provide 3D surfaces. The base of domain 50 (clay) is set at 10 m below the top of that domain.

Potential dolerite dyke intervals are flagged for samples where FE exceeds 25% and ST is below 10%, and the entire hole is flagged as potential dyke if 3 or more samples are flagged in this manner. The interpretation of dykes is carried out manually using local orientation trends and may be based on one or more holes. They are assumed to be vertical, are extended laterally half-way between drill holes, and can represent up to 15% of material in some areas but unweathered material can generally be screened out in the pit or prior to crushing as oversize boulders. The dykes tend to be well defined only when drill hole spacings are reduced to 15 m by 15 m, as shown in Figure 11-7.

Figure 11-7: Plan View of Bauxite Zone and Drill Holes Flagged as Laterite and Dykes



Source: SLR, 2023

The dolerite dykes are delineated and flagged in the block models. A lateral boundary is interpreted to constrain the resource model, and the 3D surfaces are extended where required. The lateral boundary, domain surfaces, and dolerite dyke interpretations are converted to wireframe solids. All the constraints where mining is not allowed (federal reserves, indigenous heritage sites, and rivers and protection buffers associated) are delimitated and removed after the geological modelling step. This way all the mineable reminiscent area is included in the final orebody perimeters.

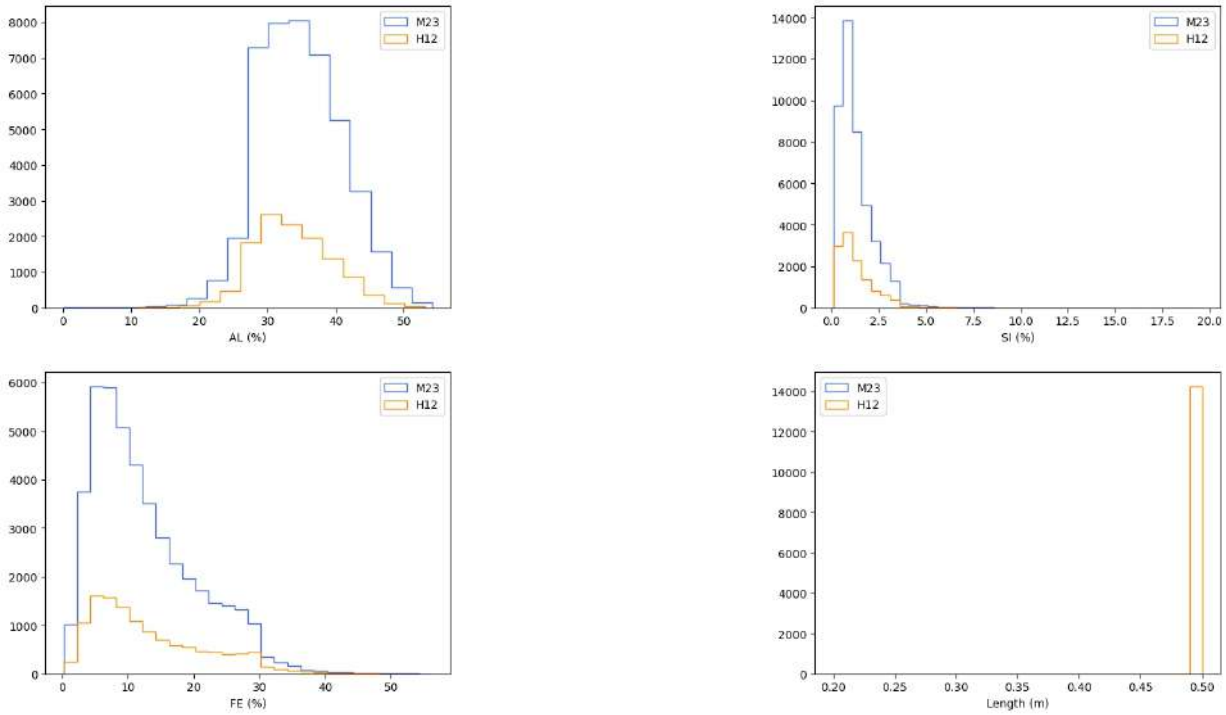
11.5 Resource Assay

The statistical data analysis procedures are carried out in DeepLime and Supervisor. Usually, the statistical analysis is performed using the univariate approach, however, FTIR and ICP scatter plots are also analyzed.

Global statistics by lithology and histograms are created for the statistical population assessment, validation after compositing and for checks against the resulting resource models. For the purposes of this report, a more detailed focus will be given for the caprock bauxite, bauxite and low-grade bauxite layers, as well as the main variables; AL, AT, FE, SI and ST.

Histograms show that AL analytes have distributions that are close to normal, while SI and FE are moderately to strongly positively skewed, as shown in Figure 11-8.

Figure 11-8: Histograms for AL, SI, FE and Length in the bauxite domain (M23 and H12 areas)



The descriptive statistics from the histograms of Figure 11-8 for the bauxite layer, as well as for the caprock bauxite and low-grade bauxite are shown in Table 11-4.

Table 11-4: Descriptive Statistics for the Main Variables

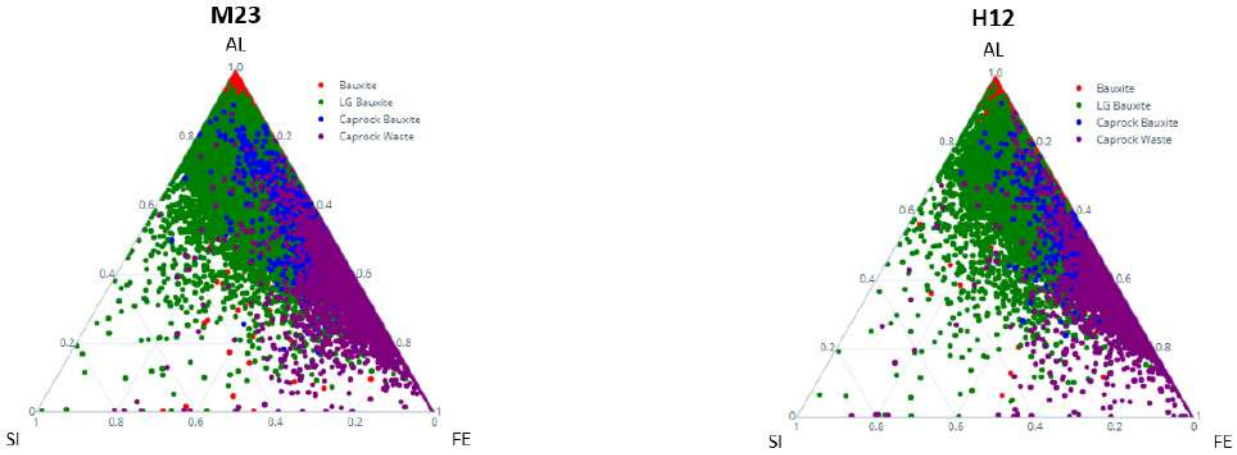
Lithology	Variable	Count	Length	Mean	SD	Variance	Minimum	Q25	Q50	Q75	Maximum
M23 Area											
Caprock Bauxite	AL (%)	5,226	2,613.0	26.83	3.96	15.72	7.75	24.57	26.47	29.25	54.73
	AT (%)	5,226	2,613.0	35.35	4.32	18.65	15.30	32.55	35.34	38.05	61.36
	FE (%)	5,226	2,613.0	33.13	7.85	61.69	0.25	30.46	33.73	37.68	59.65
	SI (%)	5,226	2,613.0	1.66	1.76	3.09	0.10	0.56	1.02	2.06	19.45
	ST (%)	5,226	2,613.0	9.32	8.13	66.04	0.25	3.96	7.07	11.61	64.66
	Length (m)	5,226	2,613.0	0.50	0.00	0.00	0.50	0.50	0.50	0.50	0.50
Bauxite	AL (%)	44,460	22,230.0	34.87	6.13	37.53	0.10	30.39	34.56	39.00	55.00
	AT (%)	44,460	22,230.0	39.78	5.95	35.38	11.65	35.75	40.03	43.89	64.90
	FE (%)	44,460	22,230.0	12.50	7.89	62.24	0.25	6.39	10.49	17.12	57.66
	SI (%)	44,460	22,230.0	1.30	0.96	0.93	0.10	0.64	1.03	1.70	20.10
	ST (%)	44,460	22,230.0	24.57	12.67	160.41	0.25	14.86	22.43	33.82	80.17
	Length (m)	44,460	22,230.0	0.50	0.00	0.00	0.50	0.50	0.50	0.50	0.50
Low-grade Bauxite	AL (%)	21,007	10,503.5	24.59	4.89	23.89	0.10	21.71	24.29	26.69	53.94
	AT (%)	21,007	10,503.5	31.63	5.89	34.64	6.09	27.54	30.90	35.37	62.25
	FE (%)	21,007	10,503.5	12.44	10.73	115.05	0.25	4.60	7.94	17.87	75.58
	SI (%)	21,007	10,503.5	4.11	2.98	8.88	0.10	2.06	3.57	5.26	35.71

	ST (%)	21,007	10,503.5	37.35	16.81	282.48	0.25	24.50	42.05	50.74	82.62
	Length (m)	21,007	10,503.5	0.50	0.00	0.00	0.50	0.50	0.50	0.50	0.50
H12 Area											
Caprock Bauxite	AL (%)	2,734	1,367.0	26.92	4.22	17.82	10.63	24.46	26.54	29.43	41.38
	AT (%)	2,306	1,153.0	34.79	4.12	16.95	19.41	32.20	34.85	37.34	50.27
	FE (%)	2,734	1,367.0	33.78	7.82	61.10	1.52	30.73	34.18	38.20	64.01
	SI (%)	2,734	1,367.0	1.61	1.77	3.14	0.10	0.54	0.94	1.92	16.28
	ST (%)	2,734	1,367.0	9.07	8.40	70.56	0.25	3.77	6.29	10.99	57.78
	Length (m)	2,981	1,490.5	0.50	0.00	0.00	0.50	0.50	0.50	0.50	0.50
Bauxite	AL (%)	12,287	6,143.2	33.76	5.78	33.43	2.03	29.61	33.19	37.51	55.00
	AT (%)	10,651	5,325.2	38.22	5.54	30.73	15.54	34.53	38.23	42.00	67.96
	FE (%)	12,287	6,143.2	13.19	8.62	74.23	0.25	6.41	10.69	18.58	55.79
	SI (%)	12,287	6,143.2	1.30	0.99	0.97	0.10	0.61	1.02	1.70	14.71
	ST (%)	12,287	6,143.2	25.85	13.04	170.08	0.25	16.08	25.25	35.72	70.09
	Length (m)	14,275	7,137.2	0.50	0.00	0.00	0.20	0.50	0.50	0.50	0.50
Low-grade Bauxite	AL (%)	8,489	4,244.5	24.40	4.95	24.54	0.10	21.50	24.23	26.79	48.61
	AT (%)	7,562	3,781.0	31.77	5.68	32.29	3.28	27.82	31.27	35.44	57.73
	FE (%)	8,489	4,244.5	14.11	11.25	126.51	0.25	5.16	9.72	22.13	64.77
	SI (%)	8,489	4,244.5	4.28	3.42	11.69	0.10	1.92	3.50	5.49	28.69
	ST (%)	8,489	4,244.5	34.83	17.14	293.95	0.25	19.83	38.84	48.83	79.03
	Length (m)	9,600	4,800.0	0.50	0.00	0.00	0.50	0.50	0.50	0.50	0.50

Clear grade trends at depth exist for most analytes and are consistent with the mineralization style. They have been adequately accounted for by the geological interpretation and the use of unfolding methods during block grade estimation.

Figure 11-9 illustrates the compositions of the different layers according to AL, SI and FE proportions.

Figure 11-9: Ternary Charts of Lithologies for M23 and H12 Areas



Missing values, that are mostly result of the validation routines, are kept as null in the database, as well as results below the detection limit are changed to values that are half of the detection limit.

11.6 Treatment of High-Grade Assays

High-grade caps for all analytes were applied to individual composites by Alcoa on a domain-by-domain basis following inspection of the data distribution, and no high-grade spatial restrictions were used by Alcoa in the resource estimation process. SLR QP notes that the top-cuts of areas M23 and H12, are in the upper break of the probability plots. Table 11-5 shows the top-cuts used for the M23 and H12 areas.

Table 11-5: Top-Cuts Used for the M23 and H12 Areas

Area	Lithology	AL	AT	FE	SI	ST	BO	EO	OX	PT	CO	SU
M23	Caprock Bauxite	48.44	70	80	12.86	56.98	8.89	9.89	15	0.248	11.9	15
	Bauxite	55	70	80	13.39	69.35	9.02	8.84	9.29	0.351	10.17	7.94
	Low-Grade Bauxite	55	70	63.21	24.82	95	6.18	9.97	8.32	1	9.6	15
H12	Caprock Bauxite	55	70	80	49.063	95.26	15	15	15	1	34	15
	Bauxite	55	70	80	49.063	95.26	15	15	15	1	34	15
	Low-Grade Bauxite	55	70	80	49.063	95.26	15	15	15	1	34	15

11.7 Compositing

Drill holes were sampled at 0.5 m intervals in the bauxite zone below the base of the overburden, with residual intervals sometimes present at domain contacts. The Polygon and GSM estimation approaches used the original drill hole data intervals. Prior to the interpretation of geological surfaces, holes used in the 3DBM resource estimates were composited to 0.5 m, and with residual intervals of maximum 50% the composite length, the total length ranges between 0.25 m and 0.75 m.

Following the interpretation of geological surfaces, drill holes used for Polygonal and GSM resource models were composited to:

- Polygonal – a single interval for samples located below the base of the overburden and above the geological floor.
- GSM – a single interval for samples located below the base of the overburden and above the mining floor. Additional composites were generated in areas where second and third pass mining floors were identified.

All grade compositing for drill holes employs length-weighted linear averages.

11.8 Trend–Analysis - Variography

Only some variogram analysis was carried out for Polygonal and GSM models as variogram parameters were not required to generate the resource models.

For the 3DBMs, variogram analysis is routine. Experimental variograms are calculated in unfolded space, with bauxite domains 20, 30 and 40 unfolded to the 10/20 domain contact and the clay domain (50) unfolded to the 40/50 domain contact.

Variograms are calculated for AL, SI, ST, and FE for the bauxite zone, standardized to a sill of one, and modelled with 3-structure spherical models, as described in Table 11-6 and Table 11-7. A single variogram model that provides the best fit to these four variables was selected.

Table 11-6: Variogram parameters for the M23 area (MineSight ZXY rotation)

Parameter	M23				
Domain	Domain 20,30,40				
Domain Name	Caprock Bauxite, Bauxite, and Low-Grade Bauxite				
Element	AL	SI	FE	ST	Combined Variogram
Nugget C0	0.07	0.04	0.03	0.01	**0.04**
First Structure C1	0.64	0.51	0.5	0.64	**0.6**
Structure Type	Spherical	Spherical	Spherical	Spherical	**Spherical**
Range 1	35	60	45	45	**45**
Range 2	20	50	40	40	**40**
Range 3	3	3	6	6	**5**
Second Structure C2	0.14	0.15	0.23	0.21	**0.16**
Structure Type	Spherical	Spherical	Spherical	Spherical	**Spherical**
Range 1	55	100	120	105	**85**
Range 2	40	80	115	100	**75**
Range 3	4	6	7	7	**6**
Third Structure C3	0.15	0.3	0.24	0.14	**0.2**
Structure Type	Spherical	Spherical	Spherical	Spherical	**Spherical**
Range 1	120	250	285	315	**200**
Range 2	95	185	155	190	**150**
Range 3	5	7	10	8	**7**
Rotation Strike (°)(1)	140	140	140	140	**140**
Rotation Plunge (°)(2)	0	0	0	0	**0**
Rotation Dip (°)(3)	0	0	0	0	**0**

Table 11-7: Variogram parameters for the H12 area (MineSight ZXY rotation)

Parameter	H12				
Domain	Domain 20,30,40				
Domain Name	Caprock Bauxite, Bauxite, and Low-Grade Bauxite				
Element	AL	SI	FE	ST	Combined Variogram
Nugget C0	0.1	0.09	0.1	0.04	**0.1**
First Structure C1	0.52	0.54	0.59	0.61	**0.56**
Structure Type	Spherical	Spherical	Spherical	Spherical	**Spherical**
Range 1	90	95	80	100	**90**
Range 2	70	80	80	90	**80**
Range 3	4	4	4	4	**4**
Second Structure C2	0.34	0.12	0.05	0.15	**0.15**
Structure Type	Spherical	Spherical	Spherical	Spherical	**Spherical**
Range 1	200	230	200	250	**220**

Range 2	150	150	150	220	**170**
Range 3	5	5	6	6	**6**
Third Structure C3	0.04	0.25	0.26	0.2	**0.19**
Structure Type	Spherical	Spherical	Spherical	Spherical	**Spherical**
Range 1	500	500	600	800	**550**
Range 2	400	500	400	700	**500**
Range 3	6	6	7	7	**7**
Rotation Strike (°)(1)	120	130	130	120	**125**
Rotation Plunge (°)(2)	0	0	0	0	**0**
Rotation Dip (°)(3)	0	0	0	0	**0**

Variogram models display nugget values of less than 10% and total ranges of several hundred meters, but 80% of the sill is generally reached within 100 m laterally. As expected, horizontal to vertical anisotropy ratios are high (typically exceeding 50:1), but there is minor lateral anisotropy. This good definition of continuity compared to the 15 m drill spacing is considered by SLR to be a benefit of the unfolding approach.

Independent variogram models for each bauxite domain and analyte are not used for grade estimation to enable correlations between analytes to be maintained during the change in support from drill hole samples to blocks, which is important for mine planning considerations.

11.9 Bulk Density

For Mineral Resource estimation purposes, density can be regarded as another analyte, and tests can be evaluated for repeatability (precision) and accuracy (bias). The determination of the metal content of a specified volume of ore is as sensitive for density as it is for grade. For bulk commodities, like bauxite, there is usually much more emphasis on grade since product tonnages are measured by a weightometer.

Alcoa does not routinely collect density data but relies on production records to define averages. This is due to the broad geological consistency of the ore zones and the local chemical and physical nature of the lateritized ore. Porosity and permeability in particular show high lateral and vertical variability, rendering repeatability of density test work meaningless. Even if large numbers of data points were available (for example by developing a density algorithm from the FTIR assaying of every drill sample, and then modelling it), the resulting model would still need to be factored by the actual mining results for local porosity.

For 3DBM resource estimation, each drill hole bauxite composite is assigned a dry *in situ* bulk density (DIBD) value based on the logged material type and the FTIR iron grade using the regression equation defined below in Section 11.9.5.

The available density test work data is summarized as follows.

11.9.1 1980 to 1992

Senini (1993) collated and reviewed all previous bauxite density data, including that by Sadleir done in 1986, and modified Sadleir's algorithm used for computation of density from individual 0.5 m sample assays of Fe_2O_3. Results are summarized in Table 11-8.

Table 11-8: Summary of Density Test Data (t/m³) from 1980 to 1992 (Senini, 1993)

Year	Source	Material	Count	Mean	Min	Max	Fe Mean	Regression On Fe_2O_3	
								Slope	Intercept
1980	DOSCO	Hardcap	18	2.200	1.98	2.52	19.35	0.0089	2.032
1986	Sadleir (in Senini)	Hardcap	14	2.364	2.08	2.75	20.88	0.0092	2.172
1992	Senini	Hardcap	67	2.409	1.81	3.10	21.00	0.0103	2.192
1986	Sadleir (in Senini)	Friable	11	1.846	1.64	2.12	8.80	0.0015	1.830
1992	Senini	Friable	27	2.225	1.88	2.79	14.30	0.0045	2.–89
1980 - 1992	reported above	Granitic	67	2.327	1.81	3.10	16.7–		
1980 - 1992	reported above	Doleritic	32	2.444	2.07	2.96	28.96		

While the approach used has merit, there are some obvious challenges:

- There are very few data points, unevenly distributed by material type and mining area
- Methodologies for collecting and testing the samples varied (sand replacement method for Hardcap, driven cylinder for Friable, water displacement are all noted)
- There is some lack of clarity on moisture, but it is assumed that the values are all in situ dry bulk density reported as t/m³.

The differences between hardcap (caprock) and friable (other material) and between granitic or doleritic derivation are however clear.

Senini (1993) concluded that the dry *in situ* bulk density (DIBD) should be estimated using a regression equation which is still used.

11.9.2 2013 to 2018 Drill Samples

Various further test programs have been attempted including collection of all material from drill samples (assuming the drill hole volume is constant) and then taking wet and dry weights and assaying for iron. There were 51 samples from 8 holes at Huntly and 93 samples from 24 holes at Willowdale. Scatter plots produced by SRK 2021a showed significant scatter of all available data for both Hardcap and Friable (other) material.

11.9.3 2016 to 2017 Pit Samples

Alcoa collected 2 kg to 5 kg grab samples from 16 Huntly pits (76 samples) and 10 Willowdale pits (41 samples). Water immersion density testing was done by Bureau Veritas. The average of 2.01 t/m³ is significantly lower than that from the 2015 study of 2.23 t/m³. The drill samples did not account for porosity and voids and were not adequately sealed.

FTIR assays for Fe_2O_3 were compared to sealed and unsealed density estimates and it was found that Senini's regression equation better predicted the unsealed densities. Thus, it appears that the current regression equation based on Fe_2O_3 assays overestimates the in situ dry tonnage.

11.9.4 2018 Downhole Density Estimates

In December 2018 Alcoa contracted downhole geophysical measurements in 54 aircore holes drilled in the Larego area. The data from this study is still being evaluated and is not used for Mineral Resource estimation.

11.9.5 Density Estimation

Ore grades range from 28 to 38% AL for paired belt sample data (see Section 8.4.4.6) whereas test work densities range from 1.5 t/m³ to 3.2 t/m³, but the data is sparse and unreliable.

For resource estimation, each 0.5 m drill hole sample is assigned a dry in situ bulk density (DIBD) value based on the logged material type and the FTIR iron grade, using Senini's 1993 regression equation:

*Hardcap (caprock) = 2.19 + 0.0103*Fe*

Friable (other) = 2.00 (used for all non-Hardcap material)

If the sample is logged as comprising a mix of Hardcap and Friable, the assigned value for that 0.5 m interval represents a volume-weighted average. There is no differentiation between granitic and dolerite derived bauxite, due to the relatively small proportion of the latter (less than 15%).

In resource estimates prior to 2017 a moisture content of 9% was assumed and used to estimate wet tonnes. Since the implementation of 3D block modelling in 2018, densities are assigned after grade estimation, based on the regression equation and Fe grade of Hardcap, and using 2.0 t/m³ for all other material, weighted by the proportion of Hardcap or other material.

11.9.6 Reconciliation of Density

Alcoa uses comparisons between the As Mined tonnages and the sampling tower weightometers to apply adjustment factors to mine design estimates, scheduling and stockpile planning. Such adjustments are not applied directly to the Mineral Resource estimate as they vary locally.

Reconciliation of Huntly and Willowdale mined production (see discussion on density in Section 11.14) indicates that the density estimates are biased, with the long-term average As Mined tonnages being approximately 5% higher than the actual production measured on calibrated weightometers.

11.9.7 Density Conclusions

The density data is limited in coverage and there is significant uncertainty regarding the methodology used for some sampling programs. A simple regression algorithm is used to estimate the DIBD for Hardcap from the FTIR assays of Fe_2O_3. This does not account for voids or porosity, nor does it differentiate between Hardcap derived from granitic or doleritic material. All other material is assigned a density of 2.0 t/m³. A constant moisture content of 9% is assumed for wet tonnages.

The SLR QP is of the opinion that the dry bulk density data is less well controlled than other analytes, however, the long history of mining production and stockpile reconciliation means that the assumed values are adequate for resource estimation.

11.10 Resource Models

11.10.1 Polygonal

For each drill hole contained within a polygon, the samples located below the base of the overburden and above the geological floor are composited into a single interval. The following numbers are assigned to each polygon:

- Thickness = average length of contained composites;
- Grade = length-weighted average grade of contained composites (density weighting is not applied);
- Density = average density of contained composites;
- Volume = Polygon area by Thickness; and
- Tonnage = Volume by Density.

11.10.2 Gridded Seam Modelling

GSM employs 15 m by 15 m cells centered on the nominal drill hole locations. Separate seams are created for the overburden, and for the interpreted Bauxite Zone (BXZ) between the overburden and the mining floor. BXZ is subdivided into separate seams where second and third mining cuts have been interpreted. Interpreted wireframe surfaces are used to assign a seam thickness to each cell, effectively the seam thickness of drill hole at the cell centroid.

Cell grade estimation used inverse distance weighting (IDW) techniques as follows:

- Hard boundaries, with each seam cell only estimated using nearby composite drill hole data within the corresponding seam;
- IDW weighting factor of 1.2 for SI and 2 for all other variables;
- 1 by 1 by 1 cell discretization;
- Isotropic search distance of 180 m, and;
- Minimum of 2 and maximum of 8 composites with a maximum of 2 composites per quadrant

Where drill holes are located at the centroid of cells the resulting cell grade estimates are essentially nearest neighbor estimates. In other words, the GSM outcomes are equivalent to 2D polygon estimates, with the usual constraint of that method, specifically that the block variances are not smaller than the composite variances.

The GSM is constrained to the interpreted lateral extents of the mining zones. For each mining zone the following attributes are determined:

- Seam Thickness = average seam thickness of the contained GSM cells;
- Grade = weighted average grade of contained cells (density weighting is not applied);
- Density = average density of contained cells;
- Volume = mining zone area by Seam Thickness, and;
- Tonnage = Volume by Density.

11.10.3 3D Block Modelling

In 2019, Alcoa commenced preparing Mineral Resource estimates using 3DBM techniques, with the aim to progressively replace all Polygonal and GSM models. To date, Alcoa has prepared a total of 89 3DBM representing around 76% of the Mineral Resource and Mineral Reserves (MRMR) tonnage.

This section describes the current 3DBM procedures, which have evolved over time, with some parts now automated or semi-automated. Changes in the 3DBM procedures have generally been minor and are not considered material to the resulting resource models.

Block models are initially generated using the ML1SA lease area grid, and with an origin that ensures that the majority of the drill holes are located closer to the block corners rather than

the centroids. The parent block size is 15 m by 15 m by 0.5 m and a sub-block size of 3 m by 3 m by 0.25 m (XYZ), respectively.

The block grade estimation includes the interpolation by ordinary kriging (OK) of AL, SI, ST, FE, EO, PT, CO, SU, OX, BO, and AT, using the same unfolding surfaces as used in the variogram analysis. Hard boundaries between the bauxite domains (DOMAF 20, 30 and 40) started to be implemented in 2022, where the previous block models were estimated using soft boundaries between these domains. A 3-pass search strategy is used for the bauxite domains and only one pass for the clay zone (DOMAF 50). A list of the search parameters is presented in Table 11-9. It is important to note that the major and semi-major orientations are in the unfolded horizontal plane, and that a maximum of 3 samples are used from any one drill hole. Thus, a minimum of four holes is required for pass one, two holes for pass two, and one hole for pass 3.

Table 11-9: Ordinary Kriging Search Parameters (MineSight ZXY rotation).

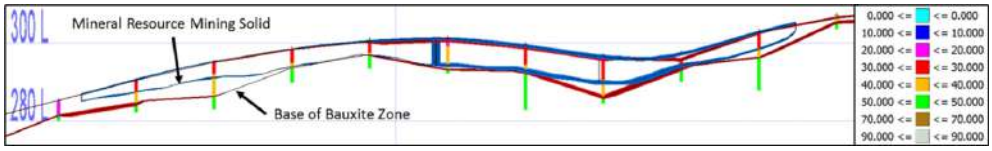
Domain	Pass	Bearing (Z)	Search Distance (m)			Number of Samples		
			Major	Semi-major	Minor	Min	Max	Max Per Hole
20, 30, 40	3	140°	300	300	50	3	27	3
	2		100	100	20	4	27	3
	1		55	55	20	12	27	3
50	1	130°	300	300	50	4	27	3

The DIBD (density) is not estimated into individual parent and sub blocks but is a post-estimation calculation based on the block domain compositions (see 11.8.5).

The OK estimation approach is designed to maintain correlations between analytes and assist in ensuring that estimation totals are consistent with the input drill hole data.

A set of wireframe solids representing the mining outlines are generated using a similar grade accumulation and threshold approach to those used for the GSM model, as shown in the example of Figure 11-10. The sub-block model is then regularized to the parent block size (15 m by 15 m by 0.5 m), with blocks located within the mining solids flagged for reporting Mineral Resources. Block tonnages are factored to reflect the proportion of the block contained below the topographic surface and within the mining solid.

Figure 11-10: Example Section showing Bauxite Zone and Mining Solid



Notes:

1. *Vertical to horizontal exaggeration is 3:1.*
2. *Drill holes colored by DOMAF variable.*
3. *Source: SLR, 2021.*

The QP summarized the information of 10 block models, shown in Table 11-10, where there is available data for a comparison between a soft and hard boundary estimation of the bauxite layer. In overall, the AL grades increased by 7% and SI grades decreased by 23%, and the tonnage is higher in most of the cases, reflecting the additional drilling.

Table 11-10: Tonnage and Grade Information Between the Original Resource Model and the 3D Block Model

Model	Original Resource Model			3DBM - Resource Model			Difference		
	Tonnage (000 t)	AL (%)	SI (%)	Tonnage (000 t)	AL (%)	SI (%)	Tonnage (000 t)	AL (%)	SI (%)
Holyoake Central	25,211	31.97	1.94	25,919	34.12	1.23	3%	7%	-36%
Windsor	8,935	32.82	2.67	8,798	33.69	2.38	-2%	3%	-11%
Cooke	15,421	30.85	2.22	18,976	31.99	1.95	23%	4%	-12%
Serpentine	16,444	32.00	1.96	20,299	32.75	1.72	23%	2%	-12%
Gleneagle	26,333	31.58	1.67	35,144	34.69	1.14	33%	10%	-32%
Buckley	17,998	33.74	1.68	27,435	35.39	1.27	52%	5%	-24%
Cobiac	23,498	31.15	1.70	30,865	34.81	1.18	31%	12%	-31%
Frollett	12,556	30.07	1.68	18,587	33.59	1.31	48%	12%	-22%
Yarri	10,044	30.90	2.04	30,362	32.51	1.62	202%	5%	-20%
Millars	26,156	30.64	2.21	24,987	32.32	1.88	-4%	5%	-15%
Total	**182,596**	**31.55**	**1.93**	**241,372**	**33.71**	**1.48**	**32%**	**7%**	**-23%**

11.11 Block Model Validation

11.11.1 Polygonal and Gridded Seam Modelling

Alcoa uses a similar general approach to validate both the Polygonal and GSM resource models which includes:

1. Visual validation of cell estimated grades versus seam composited data;
2. Comparison between composite and block model global statistics;
3. Swath plots comparing cell grades against seam composite grades; and
4. Comparison between models when upgraded with new information.

Estimated cell grades were compared visually to the drill hole composite grades to ensure that the cell grade estimates appeared consistent with the drill hole seam composite data.

As GSMs were effectively nearest neighbor estimates, checks by SRK (2021a) on several GSM models indicated excellent global and local correlation between the estimated cell grades and the input seam composite grades.

The QP undertook some independent checks on datasets and GSMs for the F54 and F55 blocks to confirm that the modelling procedures had performed as intended. Results were consistent with those observed by previous consultants and no material issues were noted.

Polygonal resource models were updated by Alcoa when drill hole data is infilled from 60 m and 30 m spacings, and then GSM models were previously produced by Alcoa after 15 m infill drilling (3DBM models are now produced routinely at this stage). Changes in tonnages and average grades (AL, SI, OX) are presented as scatterplots in Figure 11-11 for map sheets at Huntly where such infill drilling has occurred. It is noted that:

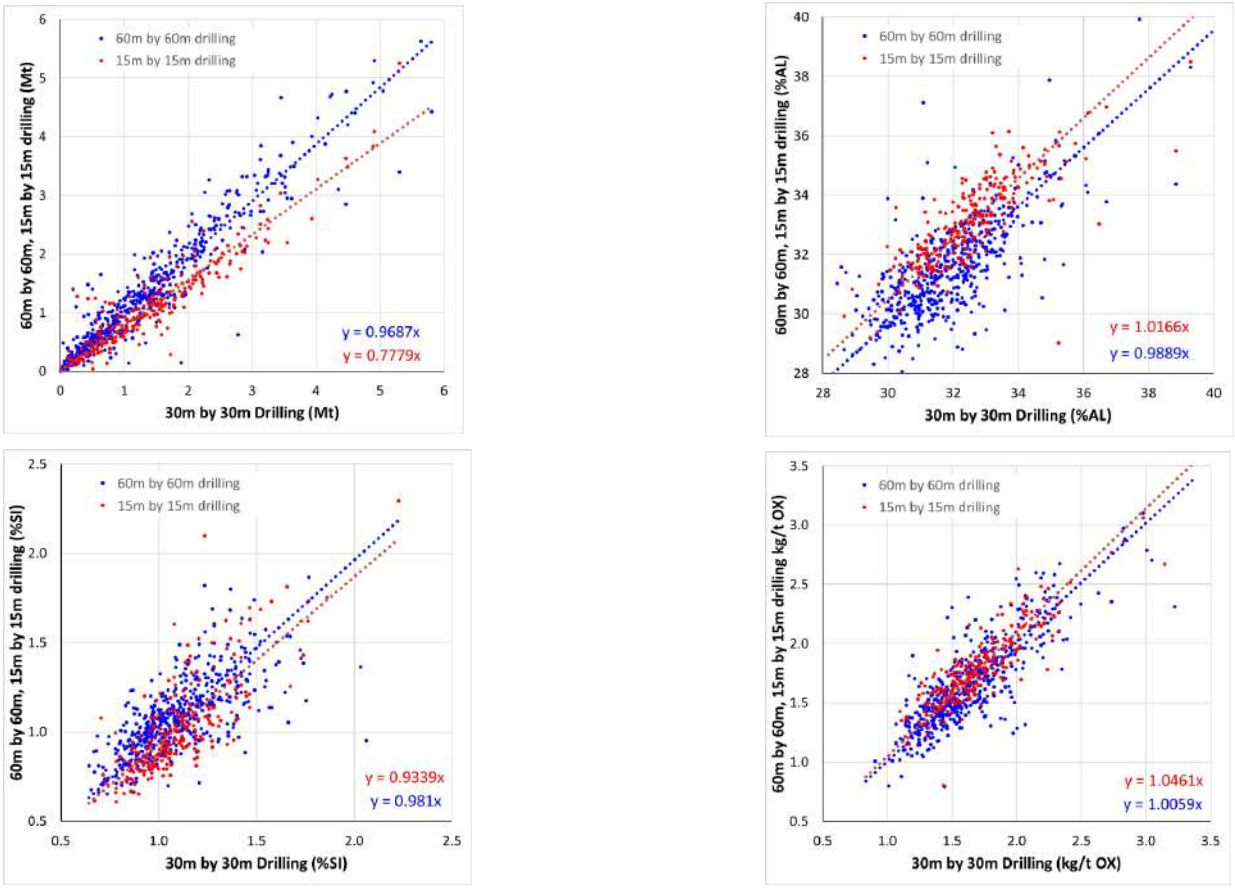
- Material differences in tonnages are evident for individual map sheets, represented by the scatter around the 45° line in the top left-hand plot in Figure 11-11.
- Globally, there is only a 3% change in resource tonnage when infilling from 60 m to 30 m, but a 22% drop in tonnage when the deposit is further infilled to 15 m drill

centers. The latter is mainly due to a change in the geological interpretation from a geological to a mining floor.

- Decreasing the drill spacings from 60 m to 15 m results in an average reduction in SI of 10%, an increase in OX of 5%, but little change to AL. These grade changes are likely due to the preferential loss of deeper DOMAF 40 material that is high in SI and low in OX when mining constraints are considered.
- Similar grade-tonnage relationships related to infill drilling were noted at Willowdale by SLR.

Applying a global correction factor to Polygonal resource model tonnages generated from 30 m and 60 m spaced drill hole datasets is not considered appropriate as local differences are highly variable and not considered to be predictable, as shown by the red dots in the top left-hand plot in Figure 11-11.

Figure 11-11: Resource Comparison Scatterplots for Huntly (Tonnage, AL, SI, OX) (SLR, 2021)



Source: SLR, 2021.

11.11.2 3D Block Modelling

Alcoa staff performs the block model validation for the individual areas through the volume checks between the geological interpretation solids and sub-block model, visual validation of block model coding and estimated grades versus composite data, comparison between composite and block model global statistics, and swath plots comparing block grades against composite grades.

SLR evaluated the information provided in the block model summary files provided by Alcoa, and also undertook independent checks on datasets and block models for M23 and H12 areas, obtaining results that were consistent with those provided by Alcoa. The SLR QP ran individual inverse distance squared (ID^2) and nearest neighborhood (NN) estimations to assist in the block model validation.

Visual validations, global statistical comparison, and swath plots were built comparing the main variables estimated by Alcoa and the parallel estimation made by SLR. The results of these comparisons for the M23 and H12 areas are provided in the following subsections.

11.11.2.1 Statistical Validation

Statistics of the blocks estimated by OK were compared against the composited and capped samples, ID2 and NN estimates. Table 11-11 and Table 11-12 present the statistical comparison for the M23 and H12 areas.

In overall, smaller differences are observed for the AL estimation of the bauxite and low-grade bauxite for the M23 area, and more significant differences are observed for the SI estimation of both areas. These differences may be related to either potential differences in the estimation parameters used by the independent estimation made by SLR, and/or small discrepancies in the sample selection used for the estimation due to the parallel workflow used by SLR. The impact of these differences can be minimized once the composites and OK means show a good correlation.

Despite the differences mentioned previously, the SLR QP is of the opinion that the statistical comparisons are reasonable.

Table 11-11: Composites, OK, ID^2, and NN statistics for the M23 area

M23													
Variable	Statistical Parameter	Caprock Bauxite				Bauxite				Low-Grade Bauxite			
		Samples	OK	ID^2	NN	Samples	OK	ID^2	NN	Samples	OK	ID^2	NN
AL	Number	5,226	19,988	19,988	19,988	44,460	157,444	157,444	157,444	21,007	101,770	101,770	101,770
	Mean	26.83	26.54	26.19	26.27	34.87	34.81	31.92	31.58	24.59	24.99	22.80	21.62
	SD	3.95	1.96	4.02	6.81	6.13	3.66	4.93	8.70	4.89	2.46	4.02	8.36
	Variance	15.61	3.85	16.16	46.32	37.53	13.40	24.33	75.62	23.89	6.04	16.15	69.83
	Minimum	7.75	15.96	3.75	0.10	0.10	14.26	6.37	0.10	0.10	9.85	2.21	0.10
	Q25	24.57	25.32	24.14	23.34	30.39	32.36	28.75	26.54	21.71	23.44	20.71	17.71
	Q50	26.47	26.18	26.16	26.71	34.56	34.40	32.00	32.21	24.29	24.72	22.90	22.55
	Q75	29.25	27.49	28.34	30.12	39.00	37.00	35.29	37.56	26.69	26.31	24.95	26.36
	Maximum	48.44	44.72	46.46	51.45	55.00	52.67	51.84	55.00	53.94	44.67	49.55	55.00
SI	Number	5,226	19,988	19,988	19,988	44,460	157,444	157,444	157,444	21,007	101,770	101,770	101,770
	Mean	1.66	1.87	2.77	2.90	1.30	1.46	2.23	2.29	4.10	4.60	5.55	5.99
	SD	1.74	1.15	2.46	3.87	0.95	0.68	1.55	2.84	2.96	1.76	2.60	4.76
	Variance	3.02	1.32	6.05	14.97	0.90	0.46	2.42	8.06	8.76	3.10	6.77	22.64
	Minimum	0.10	0.10	0.12	0.10	0.10	0.12	0.22	0.10	0.10	0.10	0.42	0.10
	Q25	0.56	1.00	1.19	0.74	0.64	0.91	1.20	0.76	2.06	3.45	3.72	2.65
	Q50	1.02	1.67	2.18	1.48	1.03	1.40	1.85	1.37	3.57	4.51	5.09	4.58
	Q75	2.06	2.43	3.57	3.35	1.70	1.98	2.77	2.57	5.26	5.52	7.02	7.82
	Maximum	12.86	8.94	31.19	40.20	13.39	9.13	24.21	38.90	24.82	20.93	32.32	40.18
FE	Number	5,226	19,988	19,988	19,988	44,460	157,444	157,444	157,444	21,007	101,770	101,770	101,770
	Mean	33.13	32.70	31.04	30.33	12.50	12.77	12.72	12.28	12.44	11.49	11.07	10.83
	SD	7.85	5.31	7.13	10.55	7.89	5.30	5.74	9.04	10.72	6.31	6.90	9.88

	Variance	61.69	28.24	50.84	111.37	62.24	28.10	32.93	81.81	114.97	39.77	47.55	97.62
	Minimum	0.25	3.72	2.53	0.25	0.25	0.95	1.70	0.25	0.25	0.25	0.42	0.25
	Q25	30.46	30.88	28.08	25.78	6.39	8.74	8.32	5.44	4.60	6.81	5.97	4.05
	Q50	33.73	33.23	32.46	32.58	10.49	12.45	11.53	9.47	7.94	9.96	8.99	6.92
	Q75	37.68	35.79	35.48	37.75	17.12	15.86	16.01	16.92	17.87	14.56	14.11	13.93
	Maximum	59.65	54.35	54.97	71.06	57.66	42.37	43.65	80.00	63.21	48.80	51.35	63.21

Table 11-12: Composites, OK, ID2, and NN statistics for the H12 area

H12													
Variable	Statistical Parameter	Caprock Bauxite				Bauxite				Low-Grade Bauxite			
		Samples	OK	ID^2	NN	Samples	OK	ID^2	NN	Samples	OK	ID^2	NN
AL	Number	2,981	64,964	64,964	64,964	14,275	297,393	297,393	297,393	9,600	205,206	205,206	205,206
	Mean	26.87	26.94	26.67	26.29	33.66	33.57	31.76	30.85	24.40	24.49	23.70	23.36
	SD	4.17	2.35	3.52	6.44	5.76	3.72	4.15	7.85	4.92	2.62	3.22	6.66
	Variance	17.41	5.52	12.40	41.45	33.23	13.81	17.25	61.56	24.23	6.86	10.38	44.40
	Minimum	10.63	16.63	0.22	0.10	2.03	9.80	1.87	0.10	0.10	7.53	0.93	0.10
	Q25	24.45	25.48	24.88	23.34	29.55	30.91	29.10	26.92	21.52	22.96	21.91	20.34
	Q50	26.49	26.60	26.52	26.39	33.11	33.18	31.54	31.01	24.23	24.27	23.51	23.70
	Q75	29.41	28.27	28.68	29.72	37.39	35.81	34.22	35.79	26.77	25.78	25.28	27.08
	Maximum	41.38	38.01	44.45	48.30	55.00	53.74	53.92	55.00	48.61	42.03	43.18	49.51
SI	Number	2,981	64,964	64,964	64,964	14,275	297,393	297,393	297,393	9,600	205,206	205,206	205,206
	Mean	1.59	1.50	2.02	2.48	1.29	1.31	1.82	2.10	4.22	4.29	4.78	5.03
	SD	1.73	1.04	2.13	3.48	0.97	0.65	1.21	2.69	3.36	2.16	2.52	4.20
	Variance	2.99	1.09	4.54	12.13	0.94	0.42	1.46	7.22	11.32	4.67	6.35	17.66
	Minimum	0.10	0.12	0.13	0.10	0.10	0.10	0.12	0.10	0.10	0.10	0.13	0.10
	Q25	0.54	0.73	0.78	0.54	0.61	0.81	1.02	0.69	1.85	2.82	3.02	2.07
	Q50	0.94	1.22	1.33	1.12	0.99	1.22	1.54	1.26	3.45	4.01	4.40	3.87
	Q75	1.89	1.94	2.47	3.00	1.68	1.72	2.27	2.31	5.47	5.28	5.97	6.49
	Maximum	12.08	9.48	30.96	32.19	9.69	8.81	24.69	31.65	23.16	19.91	26.87	34.39
FE	Number	2,981	64,964	64,964	64,964	14,275	297,393	297,393	297,393	9,600	205,206	205,206	205,206
	Mean	33.64	33.30	33.21	32.11	12.94	13.70	13.82	13.91	13.93	13.76	13.29	13.21
	SD	7.90	5.17	6.02	9.13	8.48	5.97	6.21	9.67	11.16	7.51	7.81	10.76
	Variance	62.44	26.69	36.23	83.31	71.96	35.62	38.62	93.54	124.59	56.47	60.92	115.88

	Minimum	1.52	3.09	0.66	0.25	0.25	1.16	1.54	0.25	0.25	0.25	0.36	0.25
	Q25	30.63	30.66	30.70	28.01	6.32	9.08	9.06	6.31	5.11	7.89	7.28	4.94
	Q50	34.06	33.65	33.79	32.88	10.48	12.88	12.64	10.99	9.48	12.48	11.22	8.88
	Q75	38.12	36.47	36.95	37.37	18.14	17.59	17.41	19.55	21.67	18.15	17.62	20.83
	Maximum	64.43	54.00	59.79	64.43	55.79	46.11	49.60	64.01	58.53	50.54	53.11	58.53

11.11.2.2 Visual Validation

For the visual validation, several cross sections in multiple orientations were created aiming to assess the grade distribution over the blocks and related to the composites. No major discrepancies were identified, being observed in most of the cases a good adherence of the grades estimated in the blocks with the samples around, and also the grade continuity with the topography.

Figure 11-12, Figure 11-13, and Figure 11-14 illustrate the cross sections in the block models comparing the AL, SI, and FE OK estimation and the composites.

Figure 11-12: Visual validation of Blocks and Composites for AL

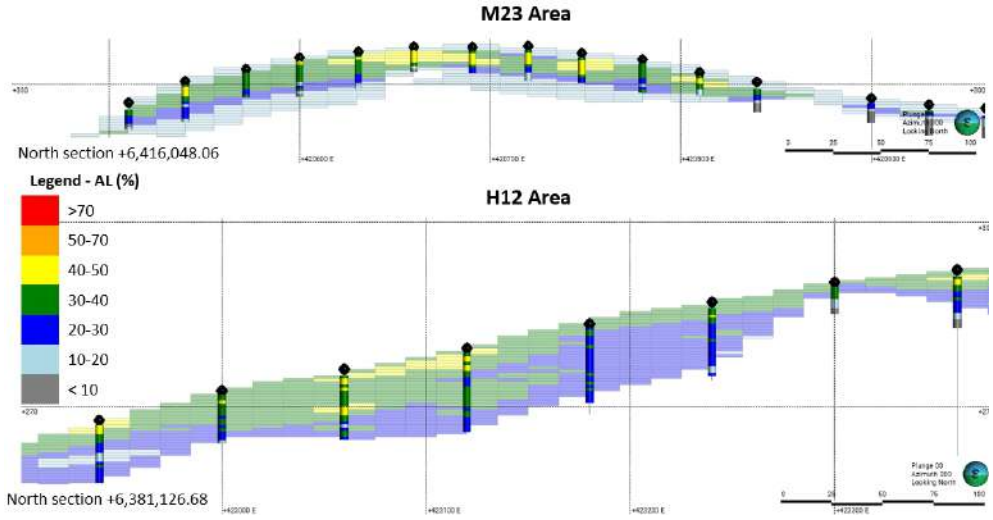


Figure 11-13: Visual validation of Blocks and Composites for SI

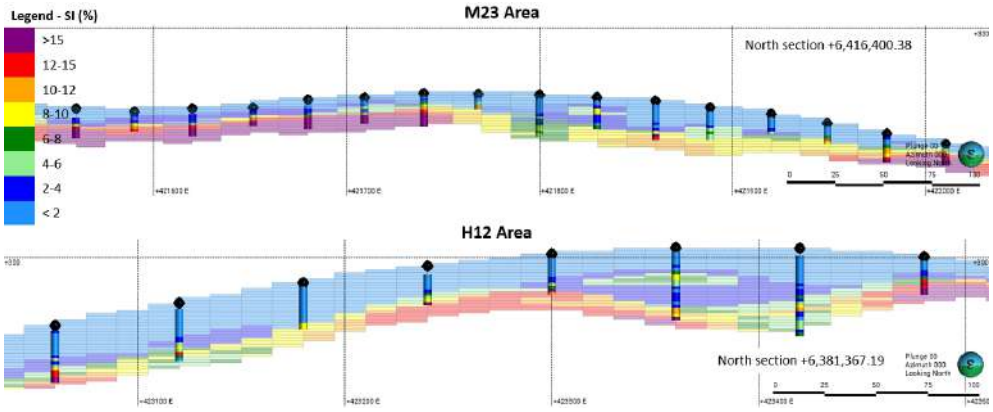
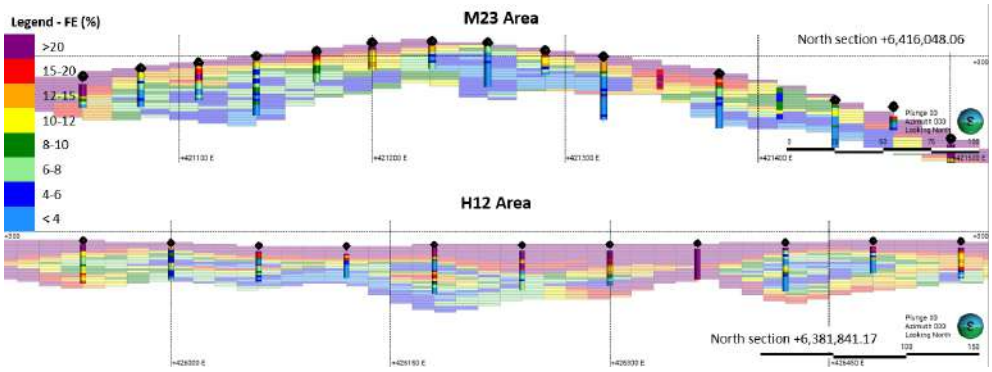


Figure 11-14: Visual validation of Blocks and Composites for FE



11.11.2.3 Swath Plots

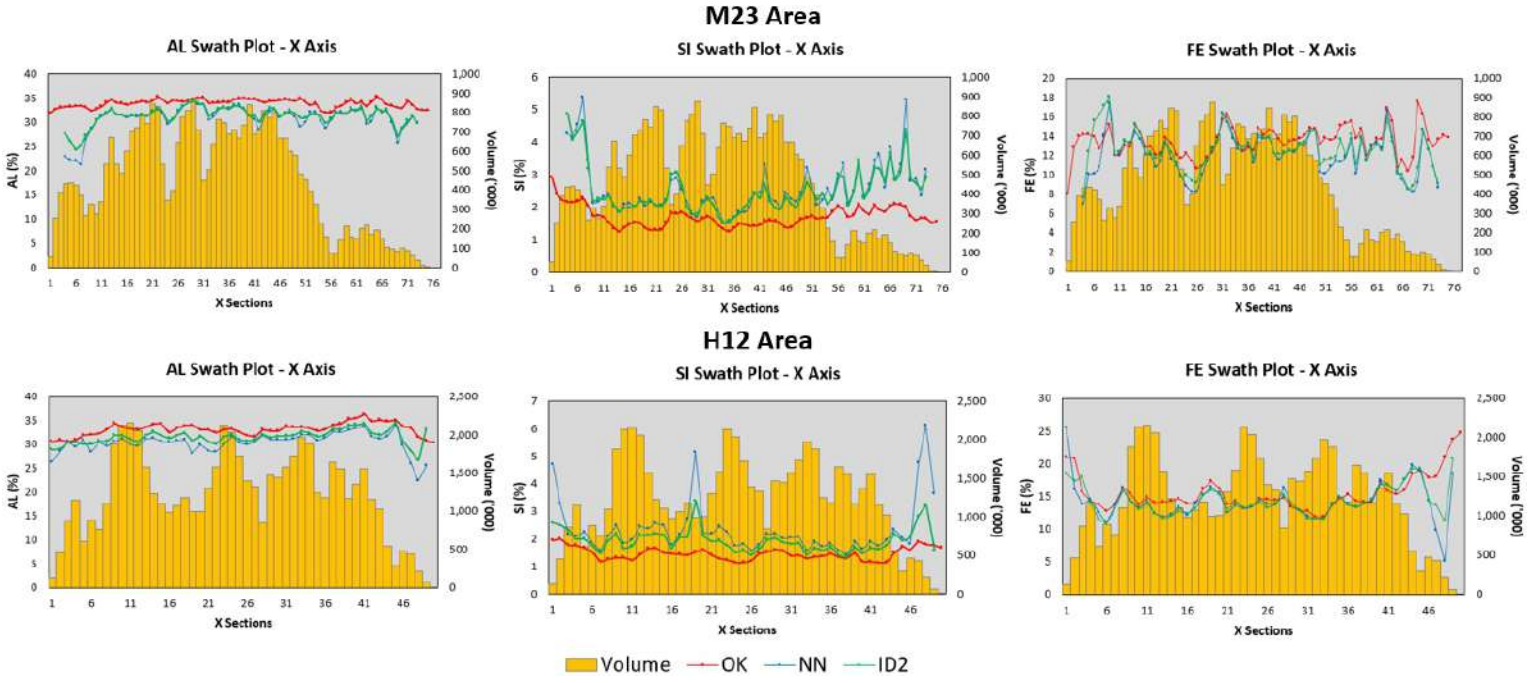
Swath plots were built comparing the OK, ID^2 and NN estimations on the X, Y and Z directions.

AL and SI exhibit opposite behaviors, showing higher values for AL and lower values for SI when compared with ID^2 and NN for the bauxite layer. These differences are around +8% and – 5%, respectively, and are also identified in the statistical validation. Additionally, the ID^2 and NN estimates show a more variable average grade locally, while the OK behavior is more constant, which indicates a potential over smoothing of the estimation for these variables. FE shows a similar local and global trend between the different estimation methods.

As mentioned before, although some variation is expected due to the differences in the estimation workflows, SLR recommends that additional estimation validation procedures be incorporated to the current validation workflow, such as the comparison with ID^2 and NN, and a smoothing degree evaluation.

Figure 11-15 illustrates the AL, SI, and FE swath plots in the X direction for the bauxite domain of both areas. Sections of 5 and 10 meters were used for the M23 and H12 areas respectively.

Figure 11-15: Swath Plots in X direction for AL, SI and FE for the M23 and H12 areas – bauxite layer



11.12 Cut-off Grade and Mining Constraints

Darling Range uses a historically accepted economic Mineral Resource cut-off grade of ≥27.5% AL, ≤3.5% SI, and ≤4kg/t OX, that is implicit in the delineation of the bauxite layer in the geological modelling stage. A minimum thickness of 2 m is also used to improve the Mineral Resource definition.

In addition to the geological modelling cut-offs criteria, the constraints described below are applied to the GSM and 3DBM Mineral Resource definition:

- a minimum area of 1 ha.
- a minimum face height of 1.5 m (distance from mining floor to the base of overburden).
- face heights exceeding 4 m are treated as multiple benches.
- an overburden to face height ratio ≤1.
- a maximum floor gradient of 1 in 7 over a minimum of 15 m for the first cut, and 1 in 5 for second and third cuts.
- a minimum access corridor of 45 m for mining equipment.

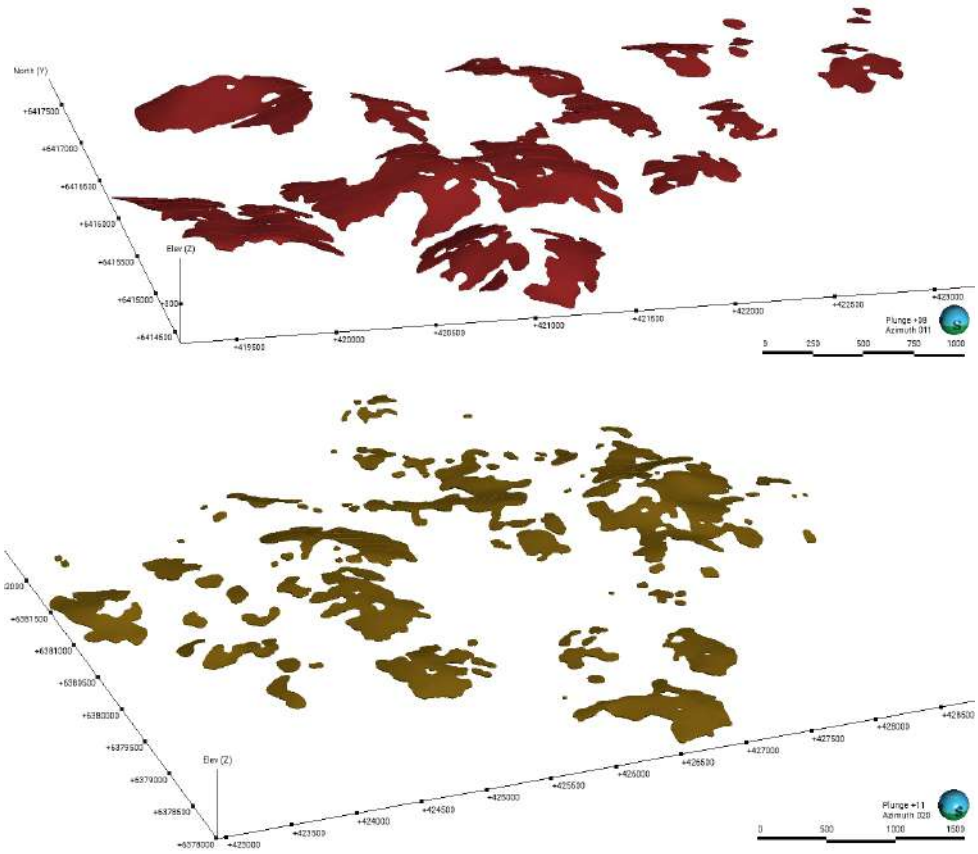
Bauxite resources can include material outside the geological modelling grade cut-offs that may also be considered as mineable, and a cut-off depth basis is used when AL grade is lower to define whether or not a block is economic.

Mineral Resources have been estimated using a LOM price of $500/t for alumina and $300/t for caustic soda, respectively. These prices were determined based on historical market trends. The $500/t alumina price corresponds to the maximum API average price over a six-month period in the past ten years, while the $300/t caustic soda price reflects the minimum caustic price over the same time frame, adjusted for delivery costs to relevant refinery locations.

The time frame used to estimate these commodity prices aligns with the long-term strategic planning window (2025–2033), which considers average pricing trends for mine scheduling. These prices are in accordance with the criteria of reasonable prospects for economic extraction (RPEE). The selected values are reviewed periodically and will be updated if material changes occur.

The optimized Mineral Resource pits are shown in Figure 11-16.

Figure 11-16: Mineral Resource Pits for the M23 (top) and H12 (bottom) areas. Vertical exaggeration 3x



Source: SLR, 2023.

The grade cut-off criteria to report the Mineral Resources is a common approach for the bauxite mines, and the QP is of the opinion that to improve the recoverable resources reporting, a re-blocked block model to a minimum practical mining scale or single mining unit should be considered. Economical parameters considering more flexible costs and bauxite prices related to the Mineral Reserves can also be implemented in the Mineral Resources workflow, aiming to optimize the bauxite mineable portion including potential marginal grades.

11.13 Reconciliation

Alcoa's staff is working on an integrated reconciliation process for all operating mines, aimed at standardizing reconciliation terminology, metrics, and standards. The workflow began development in 2023 and entered the testing phase for Darling Range in 2024 to calibrate the inputs and outputs.

The following sections describe the current reconciliation methodology and results.

11.13.1 Sampling Tower Data

Refinery feed grade is monitored for the Huntly and Willowdale mining regions using material collected prior the arrival of the stockpile stackers at the Pinjarra and Wagerup sampling towers.

Alcoa mine planning personnel rely upon historical comparisons between the As Mined estimates, which means the tonnage and grade based on the block model using a mined-out perimeter or surface, and the sampling tower data to apply adjustment factors to mine design estimates, to assist with scheduling and stockpile planning activities. The adjustments are not applied to the global reported Mineral Resource estimates as they are considered to be local factors.

Sampling tower performance was discussed in SLR, 2022.

11.13.2 Resource to Sampling Tower Comparison

Alcoa reconciles the resource (mine design) estimates with the sampling tower estimates once mining is completed for each mining zone. It is important to note that the majority of the Mineral Resources are prepared using 30 m or 60 m spaced data, whereas As Mined to sampling tower reconciliation is based on mine planning models constructed from 15 m spaced data that include additional mining constraints.

Figure 11-17 and Figure 11-18 show the annual relative grade differences for both Huntly and Willowdale respectively. These plots indicate:

- For Huntly, the reactive silica trend shifted from higher differences (above 20%) to lower differences (around 5%) between 2014 and 2023. However, in 2024, the difference increased again above 10%.
- Willowdale also shows a high variability pattern for reactive silica, historically usually above 10%, and reaching around 25% in 2024.
- The most variable pattern is for the reactive silica compared with the other elements.
- That most As Mined grades are currently within 5% of the sample grades.

The sources of the reconciliation differences shown in Figure 11-17 and Figure 11-18 are not known, but the following factors could contribute:

- Resource models were prepared using FTIR assay data, whereas the sampling tower samples are assayed using the same techniques as the REF Method (see Table 8-1 in Section 8.3.2.1) but with BD rather than MD. Alcoa assumes that this is more accurate, but that is difficult to confirm for partial digestion methods such as AL, SI, and OX.
- Changes in the resource modelling procedures from Polygonal, to GSM, to 3DBM. The latter method has only recently been introduced and represents limited material processed in recent years.
- The As Mined grades and tonnages could include some additional dilution and ore loss relative to the planned mine design.
- Differences between the Pinjarra (inspected and validated by SLR, see Section 8.4.4.6) and Wagerup sampling towers.

Incremental reconciliation improvements appear to have started around 2010, which may reflect an improvement in data quality (drilling and assaying procedures) around this time. Consequently, Mineral Resources using data collected prior to approximately 2010 are considered to be of lower confidence and the classification of resource models constructed from this data has been downgraded accordingly.

Reconciliation data in recent years falls within acceptable limits on an annual basis to support the classifications used for reporting of Alcoa's Darling Range Mineral Resource.

Figure 11-17: Resource versus Sample Plant Reconciliation – Huntly (SLR, 2024)

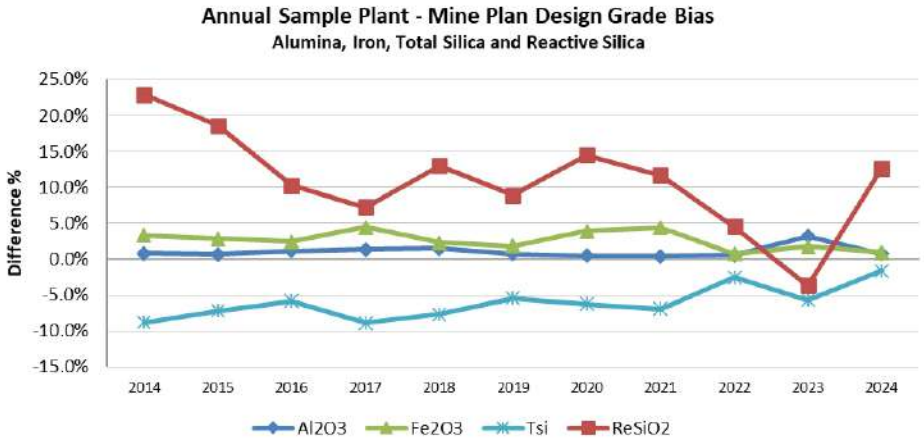
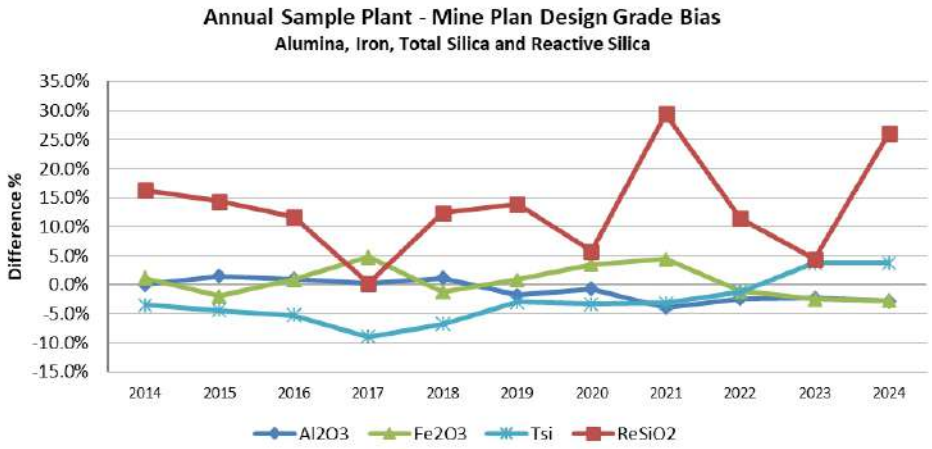


Figure 11-18: Resource versus Sample Plant Reconciliation – Willowdale (SLR, 2024)



11.14 Mineral Resource Estimation Risk

The estimation of Mineral Resources for any commodity, including bauxite, is subject to significant risks, including those described below and elsewhere in the discussion of risks associated with mining and processing of bauxite to produce alumina (see Section 12.9). An investor should carefully consider these risks. If any of the described risks occur, the Darling Range bauxite mining and processing business, financial position and operational results could be materially affected adversely.

The purpose of Technical Report Summaries issued under S-K 1300 and other similarly purposed International Codes (JORC, 2012; NI 43-101, 2014) is to ensure that known risks are disclosed by the QP subject to expectations of Transparency, Materiality and Competency. This Technical Report Summary addresses the technical risks associated with

the Geology, Sampling, Assaying, Data Management in Sections 6.0 to 9.0 and Mineral Resource Estimation in Section 11.0. The QP considers that no material technical risks are identified in those Sections.

The risks described below are not comprehensive and there may be additional risks and uncertainties not presently known, for example due to market or technology changes, that are currently deemed immaterial but may also affect the business. The QP considers that the following risks specifically pertain to the Mineral Resources declared for Alcoa's Darling Rang operations.

11.14.1 Specific Identified Risks

- Continuous improvement of all aspects of Alcoa's resource delineation programs means that changes have been incremental as refinement to previous procedures. Thus, estimates for the majority of the Mineral Resources are essentially variants of those devised in the late 1980s and early 1990s and are not consistent with current conventional practices. This is reflected in the large tonnage of Inferred Resources declared. The demonstrated successful operation of the Alcoa operations over an extended period indicates that it is unlikely that any aspects of the data collection and resource delineation process are significantly flawed, although there are recognized shortcomings.
- Drill sampling is essentially the extraction of small volumes of material taken to be representative of the large tonnages being estimated. There are always local errors of precision and biases that are not recognized. Robust sample preparation and geostatistical estimation are used to identify and overcome these errors, backed up by closed-loop reconciliation with the stockpile tower samplers. These systems may not identify changes in the underlying geology or other data as the area to be delineated expands over time.
- The Mineral Resource estimates may not contain adequate or relevant data if the bauxite is supplied to other refineries, or if processing methods change, or if some new analyte is required.
- The older ResTag and GSM estimation procedures, which represent the bulk of the Inferred Mineral Resources, are relatively inflexible, and may not contain the level of detail necessary to adequately support mining optimization studies. This has been largely addressed by the recent move to 3DBM resource estimation technique, which more easily enable the preparation of models that contain sufficient resolution and detail to support conventional mining optimization studies. These models will allow incremental improvements to address any challenges in meeting target grade specification, resolving reconciliation issues, or tailoring the estimation parameters and procedures to prepare models that better reflect local changes in mineralization characteristics. The 3DBM modelling procedures offer more flexibility in moderating any adverse effects of sampling imprecision compared to the older procedures and in producing grade tonnage curves to meet various impurity constraints (when modelled).
- Further advances in geostatistical estimation may be expected including more use of directional anisotropy (through variograms), and conditional simulation to quantify estimation risk and optimize drill sampling grids.
- A comprehensive program is required to resolve the issue of density estimation. Estimates in the resource models use a simplistic linear regression algorithm for iron rich material based on very few data, and otherwise assumed values. This deficiency is overcome by reconciliation of tonnages of material fed to stockpiles and the subsequent adoption of a downgrading factor (currently 5%) to account for differences to the model estimated density. Technology now available, including

volume surveys using drones and truck gantry scanning, infra-red moisture determination, wet mass measurement using weightometers on conveyors and LoadRite sensors on mining equipment, mean that better in situ dry density estimation may become possible if the operation requires it for better refinery feedstock control.

- The grade characteristics of the bauxite profile could be reproduced in the model, enabling optimization techniques to be used for the definition of mining floors and boundaries, better support for ore loss and dilution studies, and more accurate reconciliation studies.
- There is currently significant reliance upon the sample plant results for production scheduling and blending, as well as for assessing the reliability of the Mineral Resource estimates.

The current drill sampling methods have been improved over time, based on independent review, and the requirements for minimum impact on the Darling Range. The assaying methods, including the use of FTIR, have been comprehensively reviewed and validated. The geostatistical estimates of in situ dry tonnages and grades are reasonable and validated by comprehensive reconciliation. The SLR QP considers that these methods are appropriate to produce the declared Mineral Resources and Mineral Reserves.

11.14.2 Generic Mineral Resource Uncertainty

- Estimates of Measured and Indicated Mineral Resources are uncertain. The volume and grade of ore actually defined from these as Mineral Reserves is not predictable until mine planning is done to account for all the identified Modifying Factors. Forecasts based on the current transfer price of bauxite, current interpretations of geological data obtained from drill holes, and other information regarding the Modifying Factors, may not necessarily be indicative of future results. A significantly lower bauxite transfer price as a result of a decrease in aluminum prices, increases in operating costs, reductions in metallurgical recovery, or other changes to the Modifying Factors, could result in material write-downs of the value of the Darling Range mines.
- Should changes be required due to exigent circumstances, it may take some years from exploration until commencement of production, during which time the economic feasibility of production may change.
- Alcoa cannot be certain that any part or parts of a deposit or Mineral Resource estimate will ever be confirmed or converted into Regulation S-K Subpart 1300 compliant Mineral Reserves or that mineralization can in the future be economically or legally extracted.

To ameliorate such risks the Mineral Reserves declaration is limited to material for which extraction is currently planned within the LTMP. The Mineral Resources excluding Mineral Reserves indicate the likely potential beyond that time frame, given all the limitations on future knowledge outlined above.

11.15 Classification

Definitions for resource categories used in this report are those defined by the SEC in S-K 1300. Mineral Resources are classified into Measured, Indicated, and Inferred categories.

The Mineral Resource estimate for Darling Range is produced by aggregating many different models, produced using data of different qualities at different drilling densities, and modelled using different estimation procedures. The Mineral Resource classification has been applied to the various resource models based on consideration of the quality and quantity of the input data, confidence in the geological interpretation, and confidence in the outcomes from

the various estimation methods. The main factors that drive the Mineral Resource classification are the drill hole spacing, the quality of data collected, and the resource modelling technique. These elements will be explored in greater detail in the following paragraphs.

A drill hole spacing study (SRK, 2019a) aimed at quantifying the differences in the reliability of local estimates with different drill spacings was undertaken in 2019 using a similar approach to Alcoa's 3DBM procedures. The study concluded that drill spacings of 30 m by 30 m and 60 m by 60 m were adequate to support the delineation of Measured and Indicated Resources respectively.

Due to the different block model types, the following adjustments in the classification were done aiming to best reflect the uncertainty for each one:

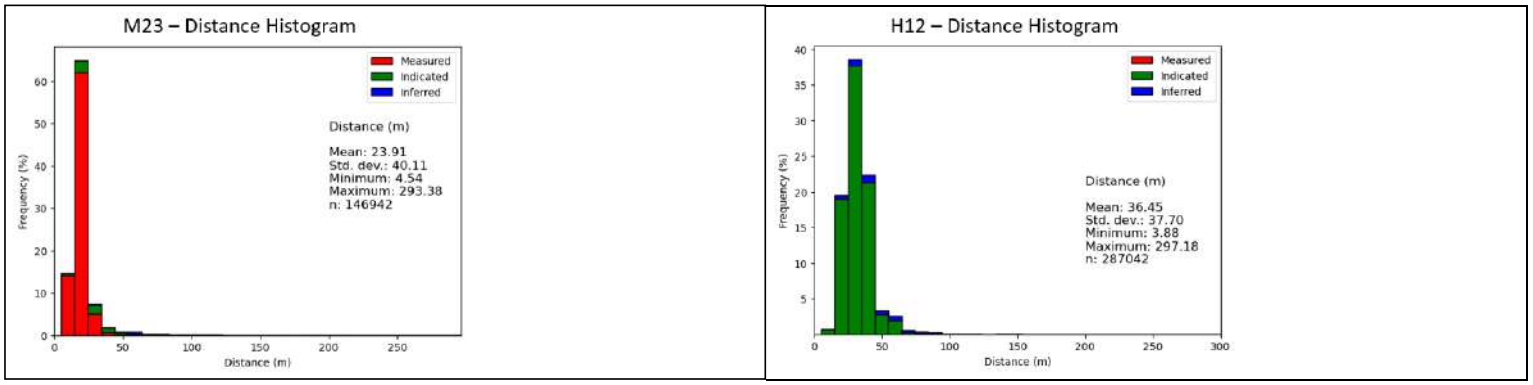
- For the GSM models where the drill hole spacing is 30x30 m, the Measured material was downgraded to Indicated, unless on a tighter 15 by 15 m drilling grid. The additional data density overcomes the potential deficiency of the GSM method. Some of the defined Measured material estimated using a significant amount of older (pre-2010) drill sampling was also downgraded to Indicated, reflecting the lower confidence in that older drilling data, since data quality (due to drilling, sampling, and assaying procedures) has been upgraded since then.
- For the Polygonal models where the drill hole spacing is 60 by 60 m, the resource estimate was classified as Inferred.

The Mineral Resource material has mining constraints applied, as detailed in the Cut-off Grade and Mining Constraints section, effectively ensuring that reasonable prospects for economic extraction are assured.

Resource classification criteria are applied in the horizontal plane and are consistent for the entire laterite vertical profile. Thus, interpretation of the roof and floor of the Bauxite Zone are implicitly assumed to be of similar confidence. In some areas, the geological floor may be erratic for Polygonal models and of lower confidence than the roof, but these areas are typically excluded when mining constraints are applied to the GSM and 3DBM resource models.

Figure 11-19 shows histograms of the resource classification and the distance of the closest sample for the M23 and H12 areas.

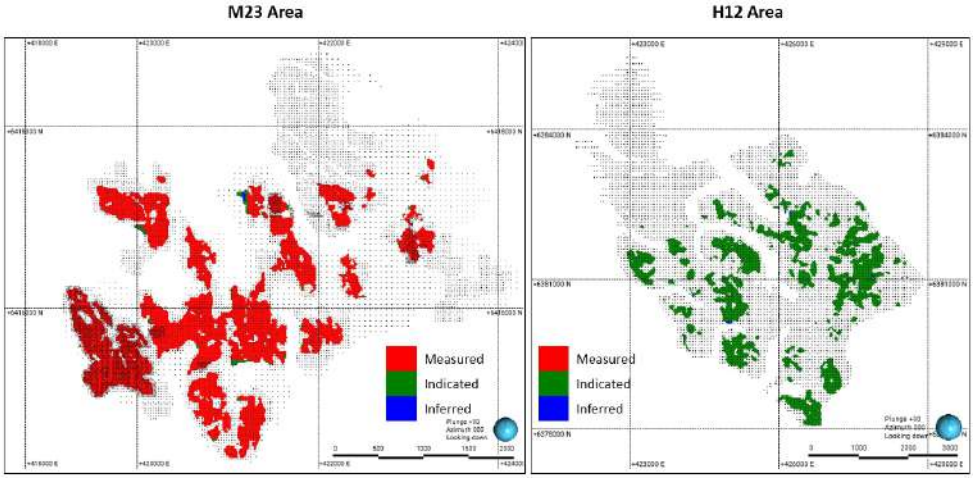
Figure 11-19: Minimum distance histograms showing the resource classification by the distance of the closest sample



A visual example of the final Mineral Resource classification within the Mineral Resource pit is shown in Figure 11-20 for the M23 and H12 areas. The great majority of the blocks within the Mineral Resource pit in the M23 area are Measured due to the 15x15 and 30x30 m drill

hole spacing, and for the H12 area the great majority is Indicated, due to the 60x60 m drill hole spacing. The final classification polygons can include small areas where the gaps between drill holes are at the next spacing increment, and they are used to assign resource classification for the full vertical profile of the laterite profile.

Figure 11-20: Plan View of M23 and H12 Resource Classification. Block within the Mineral Resource Pit



Source: SLR, 2023.

11.16 Mineral Resource Reporting

Key refinery target grade requirements for AL, SI, and OX along with practical mining considerations have been taken into account when defining resource blocks using GSM and 3DBM modelling methods. Polygonal resource models do not account for mining constraints other than a 1.5 m minimum thickness.

ML1SA contains some sub-regions for which mining permission has not been granted, due to forestry, environmental, social or other constraints, and Mineral Resources have not been defined in these areas by constraining the Mineral Resource model using ArcGIS software.

For Mineral Resource reporting, the block tonnage estimates have all been reduced by 5% on the basis that:

- the reconciliation data at both Huntly and Willowdale indicate that the As Mined tonnage estimates over the past 20 years have been consistently higher than the stockpile received tonnages after the sampling tower by approximately 5%; and
- the stockpile estimates are derived from weightometer readings, and the weightometers are regularly checked and calibrated.

A summary of the Mineral Resource estimates, exclusive of Mineral Reserves, for the three ML1SA mining regions is shown below.

Table 11-13: Darling Range Mineral Resources exclusive of Mineral Reserves by Mining Region – 31 December 2024

Category	Mine	Tonnage (Mt)	AL (%)	SI (%)
Measured	Huntly	106.1	30.4	1.89
	North	0.0	0.00	0.00
	Willowdale	33.5	30.4	1.39
	Sub-total	**139.6**	**30.4**	**1.77**
Indicated	Huntly	40.7	30.3	1.46
	North	0.8	32.3	1.38
	Willowdale	7.1	29.9	1.16
	Sub-total	**48.7**	**30.3**	**1.42**
Measured + Indicated	Huntly	146.8	30.4	1.77
	North	0.8	32.3	1.38
	Willowdale	40.7	30.3	1.35
	Sub-total	**188.4**	**30.4**	**1.68**
Inferred	Huntly	9.0	35.7	1.25
	North	15.1	31.6	1.00
	Willowdale	77.3	32.2	1.24
	Sub-total	**101.4**	**32.4**	**1.20**

Notes:

1. *The definitions for Mineral Resources in S-K 1300 were followed, which are consistent with JORC (2012) definitions.*
2. *Mineral Resources are 100% attributable to Alcoa.*
3. *Mineral Resources for the polygonal models are estimated at a geological cut-off grade, which generally approximates to nominal cut-off grades of 27.5% available alumina (AL) with less than 3.5% reactive silica (SI). Locally the cut-off grade may vary, depending on operating costs and ore quality for blending.*
4. *Mineral Resources were estimated using an alumina LOM price of $500/t* and a caustic soda price LOM of $300/t.
5. *A minimum total mining thickness of 1.5 m was used.*
6. *In situ dry bulk density is variable and is defined for each block in the Mineral Resource model.*
7. *A global downwards adjustment of tonnes by 5% is made to account for density differences based on historic mining performance.*
8. *Mineral Resources are reported exclusive of Mineral Reserves.*
9. *The reference point for the Mineral Resource is the in situ predicted dry tonnage and grade of material to be delivered to the refinery stockpile following the application of Mineral Resource pit.*
10. *Metallurgical recovery has not been directly considered in the estimation of Mineral Resources as the Darling Range operations do not include a conventional processing plant, only crushing as described in Section 14.0. The metallurgical recovery of the refineries (Pinjarra and Wagerup) are beyond the boundaries of the mining operations being the subject of the TRS.*
11. *Numbers may not add due to rounding.*

11.17 QP Opinion

The SLR QP is of the opinion that Alcoa's Mineral Resource classification scheme is considered appropriate for delineating the expected relative confidence of the Mineral Resource, in accordance with the S-K 1300 definitions as follows:

- All sampling, sampling preparation, assaying and database management practices are compliant with current industry best practice and no fatal flaws were identified for all material classed as Mineral Resource.

- Appropriate industry best practice for geological modelling techniques and variography are used to establish geological and grade continuity from appropriately spaced drill holes.
- Industry standard estimation techniques (3D block modelling or seam block modelling) are used for all Measured and Indicated Mineral Resources, using appropriate drill spacings.

The SLR QP is of the opinion that the modelling work completed to date is deemed suitable for its intended purpose. Upon evaluation of diverse technical and economic factors, it has concluded that the conditions stipulated under the Reasonable Prospects For Economic Extraction are met. This includes the effective constraint of the Mineral Resource model using the ArcGIS system, by ensuring that the model defines key parameters for the refinery, and by sound reconciliation practices reincorporating feedback into the geological model.

12.0 Mineral Reserve Estimates

12.1 Summary

A Mineral Reserve has been estimated for Alcoa's Darling Range bauxite mining operations in accordance SEC S-K 1300 definitions which are consistent with the guidelines of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves (The JORC 2012 Code).

The QP inspected Alcoa's Willowdale operations on 08 October 2024 and Huntly on 09 October 2024. Alcoa's Mine Planning department was visited 10 & 11 October 2024 to review the LTMP, Medium Term Plan (MTP) and to interview relevant personnel on these dates. This supports prior review and discussions and on other occasions (2021 to 2023). A full account of the site visit to the mines, offices, and the refineries is provided in Section 2.1.

The Mineral Reserve is classified with reference to the classification of the underlying Mineral Resource and with reference to confidence in the informing Modifying Factors. The QP considers the Proven and Probable classification to be appropriate to the deposit and associated mining operations.

The reference point for the Mineral Reserve is prior to the processing plant at the refinery.

The Proven Mineral Reserve is a subset of Measured Resources only. The Proven Mineral Reserve is included in the Long Term Mine Plan (LTMP) and is approved for mining.

The Probable Mineral Reserve is estimated from that part of the Mineral Resource that has been classified as Indicated or from Measured Resources that are included in the LTMP but not yet approved for mining.

Variable cut-off grades are applied in estimation of the Mineral Reserves, and these are related to operating cost and the nature of the Mineral Resource in relation to blending requirements. The Mineral Reserve estimate is expressed in relation to available aluminum oxide (AL) and reactive silica (SI), this being the critical contaminant in relation to the Refinery.

Table 12-1: Summary of Darling Range Mineral Reserves – Effective 31 December 2024

Region	Class	Tonnage (Mt)	AL (%)	SI (%)
Huntly	Proven	12.4	28.3	1.87
	Probable	254.3	30.6	1.77
	Total	**266.7**	**30.5**	**1.77**
Willowdale	Proven	13.7	30.0	1.38
	Probable	143.3	31.2	1.19
	Total	**157.0**	**31.1**	**1.21**
Total	Proven	26.1	29.2	1.61
	Probable	397.6	30.8	1.56
	Total	**423.7**	**30.7**	**1.56**

Notes:

1. *The definitions for Mineral Reserves in S-K 1300 were followed, which are consistent with JORC definitions.*
2. *Mineral Reserves are stated on a 100% ownership basis following Alcoa Corporation's acquisition of Alumina Limited.*
3. *The target grade for mine planning is generally between 29.0 to 32.6% available aluminum oxide (AL) and around 1.5% reactive silica (SI) and varies locally. Related to the MTP from 2025 to 2028 these targets are lower at 28.5 to 30% Al and higher at 1.8 to 2.25% for SI.*

4. *Mineral Reserves are estimated at an economic cut-off which considers grade, operating costs and ore quality for blending. The economic cut off has been estimated using a base alumina price of $400/t for Alumina. Various deductions for caustic ($500 /t), other alumina production costs, along with mining related costs and a metallurgical recovery factor for extractable alumina of 93% have been applied during optimization to provide economically minable shells for the purpose of the LTMP.*
5. *Minimum mining widths are not used due to the surficial nature of the Mineral Resource, rather a minimum mining block size of 15m by 15m by 1m deep is applied.*
6. *The reference point for the Mineral Reserve is the refinery processing plant gate, with crushing, washing (as applicable), and transportation being the only process employed.*
7. *Bulk density is variable, dependent on the nature of the Mineral Resource and is separately estimated in the Mineral Resource model.*
8. *The moisture factor used to convert wet tonnes to dry tonnes is 0.91*
9. *Numbers may not add due to rounding.*

The QP is not aware of any risk factors associated with, or changes to, any aspects of the Modifying Factors such as mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the current Mineral Reserve estimate.

The LTMP requires that permitting for operational dependencies is achieved timeously. The LTMP also requires two crusher moves (which are costed for). Longer haul distances 25km (+10km pre 2024) will be utilized over short periods at Huntly and the deliverable tonnage to the refinery will be 18Mtpa until 2032.

The QP considers that the accuracy and confidence in the Mineral Reserve estimate to be appropriate for the classification applied, which is supported by both the conservative operational processes and the long operational history.

The Modifying Factors are summarized as follows:

- Only Measured and Indicated Mineral Resources are considered.
- Only mineralization defined in mine planning work has been considered. This includes Measured and Indicated material, subject to the application of mining Modifying Factors.
- Indicated Mineral Resources are classified as Probable Mineral Reserves, subject to the Modifying Factors and mine scheduling constraints.
- Measured Mineral Resources are classified as Proven Mineral Reserves or Probable Mineral Reserves, subject to the Modifying Factors and mine scheduling constraints.

12.2 Comparison with Previous Estimate

A comparison of the current Alcoa Mineral Reserve estimate, to the previous 2023 Mineral Reserve estimate, is presented in Table 12-2. Overall, the Proven and Probable Reserves increased by 79.6 Mt (23.1%), from 344.1 Mt to 423.7. The AL grades have decreased by 2.5% and SI has increased by 18% respectively over the same period.

The increase in reserves is primarily due to the following changes:

- 11.2Continuous mineral exploration activities (for Resource expansion)
- Optimization of the Mineral Resources and Mineral Reserves considering the base alumina and caustic soda prices
- Migration from Mineral Resources to Mineral Reserves due to mine scheduling changes

Partially offset by:

- Deferred mining of the RPZ
- Constraints as per the MMP conditions described in Section 17.1.1
- Annual mining depletion (in 2024).

Table 12-2: Comparison with Previous Mineral Reserve Estimates

Category	Mine	2024 Mineral Reserve			2023 Mineral Reserve			Difference (%)		
		Tonnage dmt (Mt)	AL (%)	SI (%)	Tonnage dmt (Mt)	AL (%)	SI (%)	Tonnage (Mt)	AL (%)	SI (%)
Proven	Huntly	12.4	28.3	1.87	26.2	27.81	1.87	-52.67	1.76	0.00
	Willowdale	13.7	30.6	1.77	21.8	30.75	1.38	-37.16	-0.49	28.26
	Sub-total	26.1	29.2	1.61	48.0	29.14	1.65	-45.63	0.21	-2.42
Probable	Huntly	254.3	30.6	1.77	210.4	31.66	1.36	20.87	-3.35	30.15
	Willowdale	143.3	31.2	1.19	85.6	32.43	1.04	67.39	-3.79	14.42
	Sub-total	397.6	30.8	1.56	296.0	31.88	1.27	34.34	-3.39	22.83
Proven & Probable	Huntly	266.7	30.5	1.77	236.6	31.23	1.42	12.73	-2.34	24.65
	Willowdale	157	31.1	1.21	107.4	32.09	1.11	46.15	-3.09	9.01
	Sub-total	423.7	30.7	1.56	344.1	31.50	1.32	23.15	-2.54	18.18

12.3 Modifying Factors

A Mineral Reserve is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by application of Modifying Factors that demonstrate that, at the time of reporting, extraction could reasonably be justified.

- Mining – Alcoa's Darling Range mining operations are conventional open pit mines and have been operating for over 60 years. The practicalities of mining and associated sustaining capital and operating costs are well understood and have been incorporated in Alcoa's technical assessments to the satisfaction of the QP. An updated economic benefit basis which uses a base alumina price of $400/t has been used by Alcoa to assess the economics of mining operations. The QP is satisfied that the base alumina price of $400/t, and caustic price of $500/t, are reasonable, and the resulting benefit incorporates all related costs associated with mining, processing of the bauxite ore and the subsequent refining to produce alumina. As described above in Section 12.2, the operations have undergone recent changes that have directly affected the MTP resulting in lower AL and higher SI in the short term (36-month) plan. For a more substantive description of Alcoa's Darling Range mining operations, refer to Section 13.0. The mining schedule is discussed further in Section 12.6.
- Processing – This Mineral Reserve is stated with reference to the refinery processing plant gate, with crushing and conveying being the sole processes employed. Bauxite is refined to alumina in the refinery using the Bayer process, which has been employed at the Darling Range operations for many years. For a more substantive description of Alcoa's Darling Range processing operations, refer to Section 14.0.
- Metallurgy – The mining operations are given an ore specification by the sole customers, the refineries. Blending is undertaken at the pit, before the crusher, to ensure that these specifications are met. The QP is satisfied that the procedures employed by mining technical staff have been developed over a lengthy period and are appropriate for the suppression of metallurgically deleterious material in ore sent to the refineries. For a more substantive description of Alcoa's Darling Range metallurgy, refer to Section 10.0.

- Infrastructure – The QP has observed the Darling Range mine infrastructure to be well established, maintained and to a high standard. The operations are located near a major city, with excellent transportation, facilities, and workforce. Provision is made in Alcoa's Life of Mine (LOM) plans for sustaining capital for infrastructure replacement. For a more substantive description of Alcoa's Darling Range infrastructure, refer to Section 15.0.
- Economic – Costs and pricing have been reviewed and the QP is satisfied that the pit optimization, scheduling, and analysis undertaken by mine technical staff is appropriate to the operation and that the costs are well understood. For a more substantive description of Alcoa's Darling Range economics, refer to Section 19.0.
- Marketing – All bauxite is delivered at cost to Alcoa's Darling Range refineries, the sole customer for the mines. The refineries produce alumina, which is further refined into aluminum metal at Alcoa's aluminum plants or exported. Alumina and aluminum are internationally traded commodities and subject to normal market forces and cycles. For a more substantive description of Darling Range's market aspects, refer to Section 16.0.
- Legal – The QP observes that the Darling Range operations have been in operation for a long time (+60 years) and are licensed in relation to obligations under Western Australian legislation. The primary operational approval for Darling Range is provided under the Mining Management Plan 2023-2027 by the statutory Mining and Management Program Liaison Group (MMPLG; now Bauxite Strategic Executive Committee Bauxite (BSEC)). The 2023-2027 MMP approval was rolled over to cover the time period of 2024-2028 in October 2024.
- The MMPLG/ BSEC consists of representatives from across government and is responsible for reviewing mine plans and associated activities and making recommendations to the Western Australian Minister for State Development.
- Environmental - The QP observes that the Darling Range operations have a long history of progressive rehabilitation of mined-out areas. There are restrictions placed on some mining areas that are related to proximity to water catchments, places of social importance and fauna habitat. The current primary operational approval is by the MMPLG/BSEC. For a more substantive description of Alcoa's Darling Range environmental obligations, refer to Section 17.0.
- Social – The QP observes that the Darling Range operations have long been a major employer and economic contributor to the region and that the operations have numerous well-established community and social initiatives. A skilled workforce resides in the area, as do many service industries. The QP does not consider social risk to be material to the Darling Range operations.
- Governmental – Western Australia and Australia in general are stable, developed democracies with an advanced economy. Governmental relations with the Darling Range operations are currently facilitated by the BSEC (previously the MMPLG), which has representation from the relevant government departments. The QP does not consider governmental risk to be material to the Darling Range operations.

12.4 Basis of Estimate

Historically, Alcoa did not report material in the Measured Mineral Resource category, reporting mineralization in areas of 15 m by 15 m spaced drilling as Mineral Reserves reported to the prior SEC standard. Alcoa has subsequently incorporated S-K 1300 and JORC Modifying Factor considerations into its mine planning processes and this was observed and confirmed on site.

The QP has used the December 31, 2024 Mineral Resource estimate as the basis for its Mineral Reserve estimate. The bauxite operations are operating mining projects with a long history of production for which establishment capital has been repaid and for which sustaining capital and supported operating costs have been observed to be applied in economic analysis. Consequently, the QP considers that support by a Feasibility Study is demonstrated by the demonstrable history of profitable operation and the level of technical support for the Modifying Factors and Front-End Loading (FEL 2), or pre-project planning study, for the recent major Myara capital crusher move. Additional capital costs for the forward mines moves to McCoy have also been reviewed. The QP has reviewed the operating and planning procedures and parameters for the operations and considers that the work completed is sufficient to allow definition of Mineral Reserves.

Proven Mineral Reserves are derived from scheduled Measured Mineral Resources which are included in the Long Term Mine Plan (LTMP) and approved for mining. Probable Mineral Reserves are derived from scheduled Measured Mineral Resources which are not yet approved for mining, or from scheduled Indicated Mineral Resources. The Mineral Resource estimate reported in this document (Section 11.0) is exclusive of the Mineral Reserve.

Consequently, Modifying Factors that relate to community and environmental considerations are formally assessed. The QP considers that as a result there is low risk to not establishing Proven Reserves relating to the project.

The QP has formed an independent view of the Modifying Factors applied in the estimation of the Mineral Reserve. This view is supported by examination and verification of mine planning data and procedures and historic reconciliation information. The QP has interviewed technical staff responsible for Alcoa's operations and reviewed the operating, planning and forecast reports for the operations supplied by Alcoa.

The mine planning process excludes mineralization that is not considered recoverable due to various constraints, defining no Mineral Resource or Mineral Reserve within these zones. Such constrained zones include Aboriginal heritage sites and old-growth forest; however, these are proactively and dynamically updated by Alcoa through engagement with stakeholders, such as the community, and in response to government requests.

12.5 Dilution and Ore Loss

Dilution and ore loss are not reported separately to the Mineral Reserve. Internal and edge dilution is modelled at the mine planning stage through the application of 15 m by 15 m mining blocks to the Mineral Resource model. These regularized blocks contain proportional estimates of ore and contaminants and are optimized through the application of a Lerchs-Grossman algorithm developed specifically for the operation. This variation of the conventional Lerchs-Grossman algorithm is applied vertically, given that the shallow nature of the mineralization precludes geotechnical considerations. Blocks that do not satisfy grade and contaminant parameters against revenue are thus excluded from the mine plan.

Mining dilution is controlled by excavation of dilution at the top of the mineralization (a source of oxalate or organic contamination) and the pit floor (SI contamination). The upper contact is a sharp geological contact on an undulating surface. GPS-controlled machinery is used to locate these intersections.

Figure 12-1: Undulating Hanging Wall Hardcap Surface; and Footwall (white clay, lower right in the floor) (Left: Pearman, 2015 & Right: SLR, 2021)

Organic material reacts with sodium hydroxide in the refinery to form oxalate, which is considered to be a contaminant. Alcoa has developed a process known as Secondary Overburden Removal (SOBR) whereby the soil and clay on top of the hardcap that covers the mineralization and contains this organic material is removed by either scraper, surface miner or small excavator. This removes as much carbonaceous material overlying the undulating hardcap layer as possible. Further description of SOBR is given in Section 13.1.

A surface miner is employed as required at the Huntly mine to cut highly contaminated overburden to the hardcap contact. Historically, this results in a 2.9% ore loss, which is considered in the Mineral Reserve estimation.

The lower mineralization contact is gradational, and dilution is minimal on contaminants other than SI. This contact is defined through drilling and chemical analysis and excavation is controlled by GPS to modelled surfaces.

The Grade Control process checks the accuracy of excavation and assesses adherence to excavation of the target floor.

12.6 Extraction and Mine Planning

12.6.1 Long Term Mine Plan (LTMP)

Alcoa prepares an LTMP annually. The first five years of this plan is submitted to the statutory BSEC (previously MMPLG) for approval of mining areas. The LTMP includes a mine production schedule that demonstrates scheduling of mineralization classified as Mineral Resources for estimation as Mineral Reserves. This schedule contemplates higher confidence Mineral Resources during the early production periods, with lower confidence mineralization planned in subsequent periods (Figure 12-2 and Figure 12-3).

The schedule has several operational parameters in addition to statutory limitations (refer to Section 12.3 above):

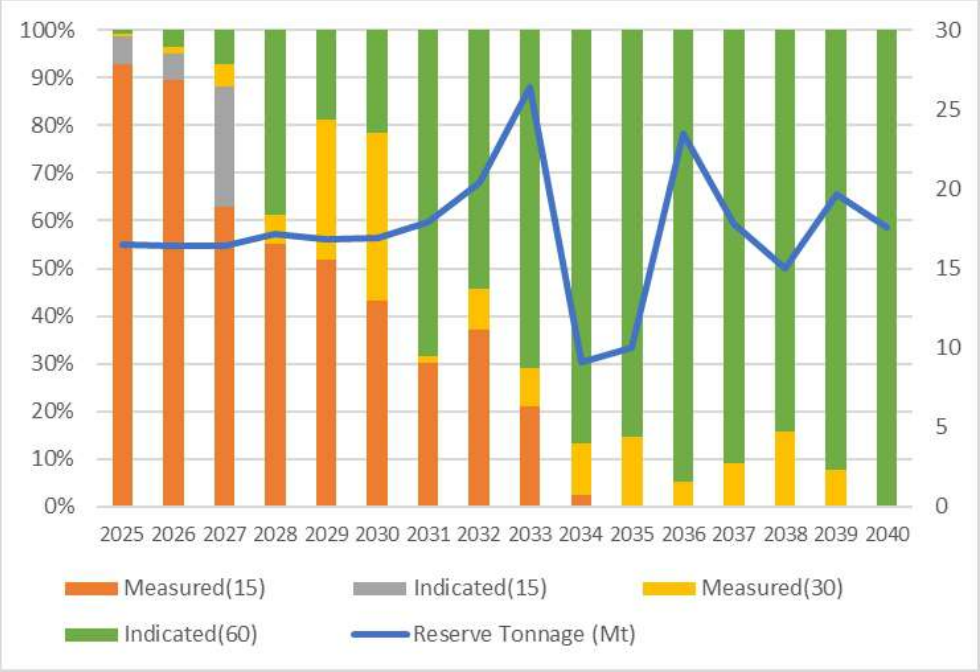
- The mineralization lies under haul roads and extraction is delayed until the road is no longer required.
- Mineralization is near a planned crusher location and mining has been delayed until the crusher is installed.
- Contaminants exclude a parcel from blending in the schedule.

- The mining areas are small and demonstrate low mining efficiency and mining has been delayed.

Confidence in the Mineral Reserves is predicated on confidence in the underlying Mineral Resources in the mining schedule. Continuous Mineral Resource definition drilling maintains an inventory of sufficient confidence to maintain Mineral Reserves.

Figure 12-2: Willowdale LTMP Resource Confidence (drill hole spacing in meters shown in brackets) (Alcoa, 2024)

Figure 12-3: Huntly LTMP Resource Confidence (drill hole spacing in meters shown in brackets) (Alcoa, 2024)



12.6.2 Mine Planning

Alcoa has been actively refining the mine planning process in such a way that the Mineral Resource and Mineral Reserve Models are updated continuously using various scripts and rationalizing of computer software. This process is mostly complete, the QP observed its progress both on the mine sites and at the Booragoon mine planning office.

The mine planning process commences with receipt by the mine planning department of the regularized and classified electronic Mineral Resource model from the geologists. The regularization process sees the Mineral Resource blocks agglomerated into blocks of 15 m by 15 m by 0.5 m vertically. Grade, bulk density and contaminant parameters are estimated into the model, which is expressed as a percentage model. This model is then manually checked and validated.

Electronic files are centrally stored, and the master versions are copied by relevant personnel for manipulation.

Optimization of the pits is undertaken using a bespoke variant of the Lerchs-Grossman algorithm designed to operate vertically. The algorithm accumulates blocks vertically on 0.5 m increments, commencing at a minimum thickness of 2m, to find the pit floor.

The optimization is driven by Net Present Cost (NPC), rather than the conventional Net Present Value (NPV). The optimization considers a number of cost and consumption inputs which include caustic, lime, electricity, and gas power to be deducted from the base alumina price of USD 400/tonne.

Geotechnical constraints are not relevant, given that the pits are generally around 4 m in depth and placed on gently undulating country (Section 7.9). Contour mining is applied in areas of greater topographic relief, whereby mining progresses across the contour, maintaining as consistent a pit floor as possible.

Optimization parameters are calculated for each block, including costs associated with drilling, blasting and ripping and haulage cost, which is estimated from major haulage roads and minor pit access roads against gradient. Electronic surface models are prepared to constrain the optimization; these are informed by LiDAR radar surveys and model the topography, the base of overburden and the base of mineralization, derived from chemical analysis of resource definition drilling samples. Caprock requires drilling and blasting, and modelled surfaces are contoured for thickness, which is derived from examination of drill logs and high-Fe assays.

Pit shells are visually assessed for practicality and minimum mining widths and any impractical pit shells are removed. Minimum mining widths vary according to topography and material type.

Individual areas are optimized separately, and the resultant pit shells are combined to provide grade and contaminant specifications for Life of Mine (LOM) scheduling. Haul roads are divided into 50 m segments with appropriate cost increments applied to each segment using commercial haul road optimization software. This process electronically tags each block with haulage cost information as a function of distance of the relevant node (haul road) from the nearest crusher. The software then normalizes the data by calculating the equivalent flat haul distance, maintaining a gradient of less than 8% for all nodes.

The model is then depleted for mined material and blocks that have been otherwise committed for development or have been mined out and also for environmental constraints.

Environmental constraints include proximity to streams, designated heritage areas (both Aboriginal and European) and the water catchment offset. GIS software is used to continuously generate electronic shape files that are converted daily to string files for import into the mine design software. These are then used to deplete the model in relation to environmental constraints.

Mineralization that has been identified as being under infrastructure is scheduled for mining only after that infrastructure has been removed in the LOM plan.

Noise zones are those where noise from the mining operations will potentially exceed allowable levels and the operation actively seeks to maintain lower noise levels than those mandated. Mining in these areas is undertaken by contract miners on day shift only and attracts higher costs than conventional owner-operator mining, which is applied to most of the operation.

The regularized model is then coded for the above parameters and checked. All the above processes are logged, checked, and validated both electronically and visually. Electronic scripts are then run in the mine planning software, resulting in the reporting of Mineral Reserves.

The Value in Use (VIU) revenue for mined ore is defined from an in-house optimization and integrated mine planning process. This VIU is calculated by subtracting the costs associated with mining and refining activities from the base alumina price. The costs considered in this calculation include various consumable inputs such as caustic, lime, electricity, and gas power, all of which are deducted from the base alumina price of USD 400 per tonne.

A discount rate of 12.00% is mandated by the Finance Department and applied to the NPV scheduler during the mine planning process.

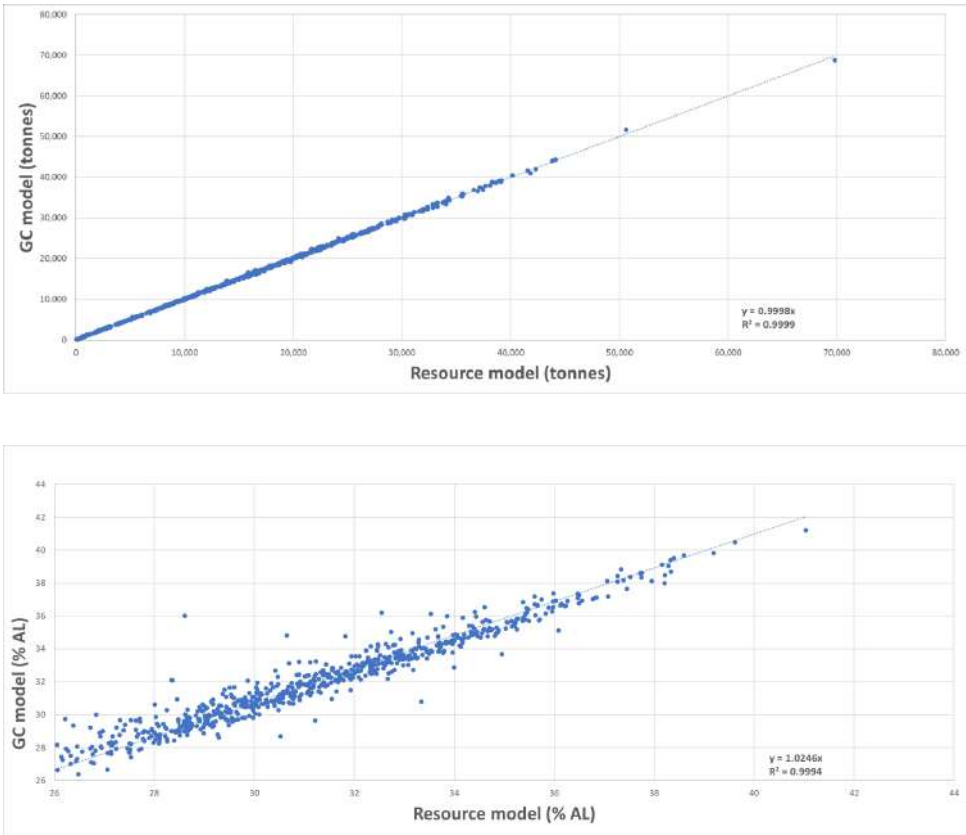
The QP notes that costs and revenues used in this process demonstrate reasonable variations consistent with market trends over time and that revenue has remained constant over the past year.

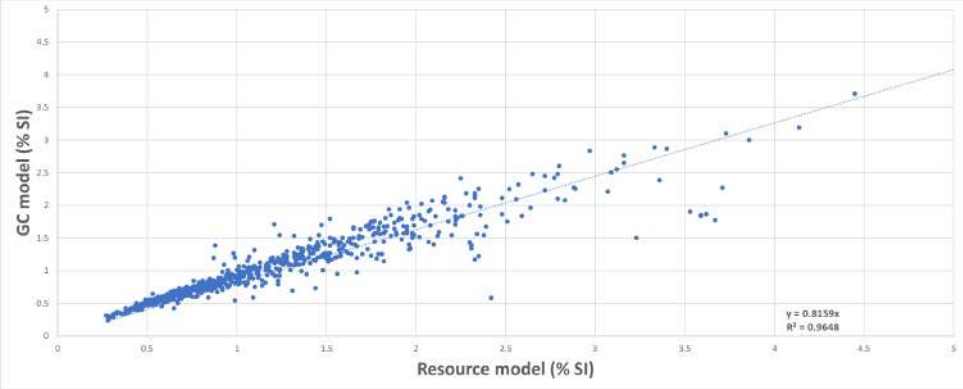
In practice, the Grade Control Model is used to direct mining at the bench scale, because it has more up-to-date drilling data than the Mineral Resource Model. Reconciliation is undertaken between the Mineral Resource, Mineral Reserve and Grade Control Models, with

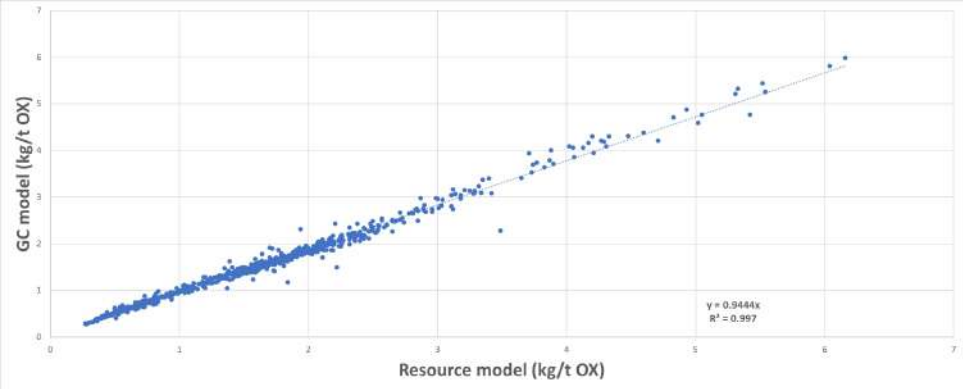
the QP observing the reconciliations between Mineral Resource and Grade Control Models to be within acceptable parameters. Reconciliation of the Mineral Reserve model has not been regularly undertaken in the past and this process was observed to be in development.

Figure 12-4 shows an example of the reconciliation between Resource and Grade Control models undertaken regularly by Alcoa.

Figure 12-4: Example of Reconciliation Between Mineral Resource and Grade Control Models for Tonnage, Al, Si, and OX (Alcoa, 2022)







The resultant pit shells are scheduled using specialist automated mine scheduling software. A text file containing the model and its parameters is exported to the scheduling software, which is programmed with current wait times and the current mining capacity of 26.5 Mtpa (Huntly) & 11 Mtpa (Willowdale). The software calculates and defers, as much as possible, capital haul road development costs for each block and identifies an optimal schedule.

Sustaining capital is calculated and added for haul road maintenance and equipment replacement. Not all machinery is capitalized, some being leased, and this is included in the operating cost. Review of ownership costs against leasing is constant and appropriate factors applied to the model.

The resultant model is coded for grade and contaminants and blocks are flagged with the appropriate mining sequence. Mineral Reserve blocks are contained within the LTMP schedule. The model is then re-exported as a text file to the mine planning software and distributed to the relevant mine planning departments and mine closure engineers for detailed planning.

12.6.3 Abandoned Resources

Some planned mining areas that are included in the schedule are unable to be totally mined for a variety of operational reasons. These reasons usually relate to issues with rock outcrops, hard ground, contamination and access difficulties that are encountered when developing a new mining area. This process drives the continuous development of new mining areas to maintain production capacity.

Alcoa's recorded average abandoned mineralization between 2016 to 2019 (inclusive) is estimated at an average of 4.4% of Huntly (being 1.5% abandoned + 2.9% scalped using surface miner) and 2.0% of Willowdale planned production but can vary materially. These factors are applied to forecast production in the Mineral Reserve estimation process.

12.7 Economic Cut-off Grade

An economic cut-off grade has been used for mine production planning. The process is based on mine optimization to define economic boundaries of minable bauxite in measured or indicated classification from the resource model. The economic cut-off grade is dependent on various operating costs deducted against a base alumina price. The base alumina price has been estimated as a 9 year average (2025 to 2033). Mining cost estimations are also based over 9 years as related to the LTMP. The deductions and basis are shown in Table 12-3. This benefit has been updated for the 2024 LTMP by Alcoa's Mine Planning Department and was reviewed by the QP during the 2024 site visit to the mine planning department. It is the view of the QP that the economic cut-off grade reflects a reasonable market expectation for the sales of bauxite from the Darling Range based on alumina price movements and associated trend over the previous ten years. SLR have reviewed the various detailed inputs and are satisfied that the economic parameters applied to the cut-off grade definition are appropriate. Mining and refinery costs form part of the LTMP (2025-2033), with some key variables summarised in the table below.

Table 12-3: Highlighted Cut Off Grade Variables

Plan Input Assumption	Units	Value
Base Alumina Price	USD/t	400
Caustic Price (delivered)	USD/t	500
Recovery	%	93
Exchange Rate	$A/USD	0.7
Moisture Factor	-	0.91

The economic cut-off is determined by subtracting all incurred costs from the base alumina price. Operating costs are primarily influenced by haulage distance and the reliance on contract mining. Contract mining is used in areas where operations are limited to day shifts due to environmental restrictions. Haulage costs increase as the distance between the mined ore and the crusher station increases, which depends on the mine layout.

The current economic cut-off process described presents grades generally above 25.5% for AL and below 3.5% for SI. As previously reported an optimization process is followed that considers the costs associated with mining and processing the ore from each resource pit. Each resource area block model has its cut-off calculated before pit optimization is performed. Commodity pricing is described previously in Section 12.6.2.

12.8 Metallurgical Factors

The Huntly and Willowdale Darling Range mining operations currently feed the Wagerup and Pinjarra refineries. The Huntly mine provides feed for the Pinjarra refinery and the Willowdale mine provides feed for the Wagerup refinery. As announced in January 2024, the Kwinana refinery ceased production in the second quarter of 2024 following phased curtailment. The LTMP allows for a potential restart of Kwinana within the next ten years. Ore is transported via conveyor belt from the relevant crushers, and the battery limit for the mining process is the refinery gate. All three refineries are established, mature and use the conventional low-temperature Bayer refining processes.

The refineries are designed to accommodate long-term average bauxite and impurity grades from the mines. Internal Alcoa specification contracts are established between the refineries and each of the mining operations and these contracts are updated annually and contemplate a five-year mine plan. These contracts set impurity targets, the key impurities being SI, oxalate, and iron. It is noted that short term (i.e. up to 2027) supply AL grades will be at lower acceptance limits and SI will be at towards upper acceptance limits. Mineral processing testing is discussed in Section 10.0, and processing and recovery in Section 14.0.

The internal LOM (nominally 2045) specification for bauxite is based on a 27.5% AL cut-over acceptance grade, which is supported by the MTP, LTMP and extensive operating history at the refineries. The Figures below show the LTMP for Al schedule for both Huntly (Figure 12-5) and Willowdale (Figure 12-6).

Figure 12-5: LTMP: Huntly

Figure 12-6: LTMP: Willowdale

Deleterious elements are managed within contracted limits by blending at each mine, with the aim of minimizing variation. The refineries conduct metallurgical test work to ensure that any potential effects of variance caused by new mining areas are understood.

Geometallurgical analysis is conducted on drill hole samples using FTIR analysis as a primary method. A subset of the samples is assayed using conventional analytical procedures, with the results used for FTIR batch calibration and quality assurance purposes. The Mineral Resource model is coded for geometallurgical grades for available alumina and reactive silica. This information is reported in the Mineral Resource estimate as well as the Mineral Reserve estimate.

The Mineral Reserve is based on geometallurgical criteria that have been set by the refineries as suitable for producing alumina to agreed product marketing specifications.

12.9 QP Opinion

The QP considers that, because of the integrated process by which Measured and Indicated Mineral Resources translate to Mineral Reserves for Alcoa's Darling Range operation, there are no foreseeable risks associated with Modifying Factors (mining, processing, metallurgical, infrastructure, economic, marketing, legal, environment, social, or government) that materially affect the Mineral Reserve estimate at 31 December 2024.

The operations are sensitive to the economics related to the actual grade mined, as such lower alumina or higher reactive silica grades or a combination of both remain the main risk to the overall economics. Alcoa has demonstrated through its grade control program an effective control to minimizing the dilution and mining at its forecast grades. Grade control is particularly important along ore-waste boundaries to maintaining expected mined grades, Alcoa demonstrates processes to handle and define boundaries to mitigate these risks.

Haul distance is considered a major cost driver due to the hauling cost making up a significant portion of the mining cost. Hauling directly links to fuel cost and maintenance, the combination of an increased hauling distance as well as an increase in fuel cost and maintenance would result in a significant impact on the operational costs. Haul distances to Reserve blocks typically increase over time until such time there is a plant relocation and so there is an expected increase in hauling distance in the medium term. It is noted because of permitting challenges that there are some significant increases during the MTP schedule in haulage distances. Alcoa has previously managed such risks by defining when the major plant needs to be relocated, however permitting challenges in the short term need to be overcome with some longer than normal average haulage distances.

Alcoa may be unable to obtain or retain necessary permits, which could adversely affect its operations. The Darling Range operation is subject to extensive permitting requirements. The requirements to obtain and/or achieve or maintain full compliance with such permits can be costly and involve extended timelines and possible delays. Alcoa strives to obtain and comply with all required permits but there can be no assurance that all such permits can be obtained and/or always achieve or maintain full compliance with such permits.

13.0 Mining Methods

13.1 General Description of Operations

The Huntly and Willowdale mines employ conventional open pit mining practices and equipment. The fleet is mixed between contract and owner-operator, depending on the nature of the task at hand. Owner operator equipment is used for mining the bulk of the Mineral Reserve, operating in areas away from those subject to environmental restrictions. Contract mining operates smaller equipment, day shift only, in environmentally (noise) sensitive areas and at the perimeter of the mining area.

The Huntly mine currently operates at a nominal mining capacity in order to supply about 17 Mtpa to the Pinjarra refinery. The Willowdale mine further supplies 10 Mtpa to Wagerup refinery.

The Darling Range operations currently have a nominal expected LOM until 2045 (when ML1SA expires), although provision exists for Alcoa to apply for a further mineral lease (Section 3.2). As an annual rolling process, a Long Term Mine Plan (9-10 years) for the estimation of Mineral Reserves (Section 12.6.1) is developed from Measured & Indicated classified Mineral Resources. Appropriate modifying factors are applied to facilitate the conversion of the Resources to Reserves. The Reserves currently extend beyond the mine schedule (LTMP) that forms the basis of the 9-year LOM plan (see also Section 19.0). Mining units of 15 m by 15 m by 0.5 m vertically are in use at the operations (Section 12.6.2).

Dilution and ore loss are not reported separately to the Mineral Reserve (Section 12.5). Internal and edge dilution is modelled at the mine planning stage through the application of 15 m by 15 m mining blocks to the Mineral Resource model. These regularized blocks contain proportional estimates of ore and contaminants and are optimized through the application of an algorithm of a similar nature to Lerchs-Grossman developed specifically for the operation. This variation of the conventional Lerchs-Grossman algorithm is applied vertically, given that the shallow nature of the mineralization precludes geotechnical considerations. Blocks that do not satisfy grade and contaminant parameters against revenue are thus excluded from the mine plan.

Mining recovery from Huntly and Willowdale are estimated to be 95.6% and 98%, respectively.

Figure 3-3 shows the outlines of mined areas, Mineral Resources, and Mineral Reserves, which are collectively taken as representing the final pit outline, as currently understood. This does not account for any required extensions or additional licenses and assumes that all Mineral Resources and Mineral Reserves are ultimately mined.

13.1.1 Clearing

Following definition of Mineral Reserve blocks, vegetation is cleared ahead of mining by an Alcoa managed contractor on behalf of the Western Australian State Forest Products Commission (FPC), saleable timber being harvested for use. Clearing approval is sought ahead of mining allowing time for harvesting of saleable timber before vegetation clearing.

13.1.2 Stripping

After vegetation clearing and harvesting of saleable timber, Alcoa operations commence stripping topsoil and Secondary Overburden Removal (SOBR) using small excavators, scrapers, and trucks. Soil is stockpiled at the site, away from the proposed pit, for rehabilitation purposes. Soil is stockpiled in windrows in such a manner that it maintains its organic viability.

The dieback fungus (*Phytopthora spp*.) is endemic in parts of the mining areas, which are flagged by Alcoa and precautions are taken to contain the fungus, which is lethal to the eucalyptus forest. The QP observed these precautions, which include separation of machinery fleets in areas where dieback is present and washing of machinery before entry into different areas. This represents a minor short-term scheduling challenge, though it is well managed.

13.1.3 SOBR

The SOBR process is specialized and aims to remove as much overburden and organic material from the top of the mineralization as possible. This organic material reacts with NaOH in the refinery to produce oxalates, which are deleterious to the process. After scrapers have removed the topsoil and overburden, small (60t class) excavators equipped with swivel buckets are used to scrape clay containing organic material from the undulating surface of the hardcap that sits on top of the mineralization. This is later used to backfill mined out areas.

Figure 13-1: SOBR (SLR, 2022)

The SOBR process is applied to those areas where hardcap has been identified by Resource definition drilling, using the drillers' logs. The hardcap is drilled and blasted before mining with the rest of the bauxite sequence.

In areas without hardcap, wheel tractor-scrapers of 24 m³ capacity remove soil overburden, scraping directly to the top of the mineralization model surface, being controlled by GPS. This material is similarly stockpiled for rehabilitation or used as backfill in exhausted mining areas.

Figure 13-2: Topsoil Removal (Background), Blasting of Hardcap and Marking of Ore (foreground) (SLR, 2021)

When required a surface miner is employed in limited areas of hardcap in the vicinity of blasting-sensitive infrastructure such as power lines. The surface mining may also be employed in lieu of SOBR where appropriate, for example, where there are high levels of contaminants in the hardcap. During both the 2023 and 2024 visits it was noted that as there were no operations of sensitivity around infrastructure the surface miner was not required.

13.1.4 Mining

Mining progresses on 4 m benches, utilizing a contour-mining sequence, cutting benches across the topography, working from top to bottom, maintaining the flattest floor obtainable to a maximum gradient of 1:7. Most of the mineralization lies beneath a gently undulating topography and contour mining is minimal.

Figure 13-3: Contour Mining (SLR, 2021)

On completion of overburden removal, the exposed surfaces are sheeted with 0.25 m of suitable mineralized material taken from the dozed second cut in adjacent pits. Where hardcap is present, a drill rig is mobilized, and the hardcap drilled and blasted on an appropriate pattern to fragment the hardcap.

Trucks haul the mined ore to fixed crushers, which crush the material to varying sizes (refer to Section 14.0) before conveying down the escarpment to the refinery where it is stockpiled to give surge capacity.

No visual grade control is applied, the ore contacts being gradational. Grade control is achieved by mining to electronic ore surfaces derived from drill assays, control being achieved using GPS equipped equipment, the GPS being regularly calibrated.

Blending takes place at the pit face before which the crushed ore from different pits is assessed using specialist short-term mine planning software and pit production is scheduled to achieve the desired blend.

The QP is of the opinion that considering the style of mineralization, the average depth of the deposit, and the material characteristics of the overburden material whereby it is amenable to ripping / excavation using conventional earth-moving equipment, the open pit mining method adopted at Darling Range is the most appropriate method for the Mineral Reserves.

13.2 Haul Roads and Infrastructure

13.2.1 Haul Roads

Haul roads are the limiting factor to the mining operations. Major haul roads are established to each mining area, honoring the topography at the least possible gradient. Roads are unsealed and formed by conventional bulldozer and grader and sheeted with appropriate material. Once established, haul road maintenance was observed to be continuous and forms part of the operating cost for each mining area. Haul roads are observed by the QP to be treated as sustaining capital in an appropriate manner.

Figure 13-4: Truck on Haul Road (SLR, 2021)

Figure 13-5: Haul Roads with Berms (SLR, 2021)

Secondary haul roads to individual mining areas are formed in the same manner, with provision for rehabilitation once mining is complete.

The Darling Range climate is subject to wet winter months and trafficability of haul roads during these months is included in mine planning. Redundancy during wet months is planned for, allowing well drained areas to be mined in the wet.

There are some restrictions to the establishment and operation of haul roads, and these are incorporated into the road design and operation:

- Water runoff from the roads is impounded in sumps and these were observed to be well formed and appropriate, being regularly dewatered, emptied of sediment and cleaned. This water is retained within the operational area.
- Dieback control necessitates separation of machinery between that which operates in dieback-prone and dieback-free areas. This presents short-term scheduling challenges that were observed to be well controlled.
- Proximity to a major water catchment restricts the volume of hydrocarbons that may be taken into particular areas around the catchment. This was observed to be adhered to, with particular road rules and scheduled delivery of approved volumes of hydrocarbons along haul roads that are specially formed with impoundments in the event of spillage.

The QP has observed that Alcoa's Darling Range operations have a well-established system for haul road design, construction, maintenance and regulation and that this does not present a major impediment to mining efficiency.

13.2.2 Infrastructure

The main elements of infrastructure at Alcoa's Darling Range mining operations are the location of crushers and conveyors to the refineries. These crushers form hubs for the mining operations, connected by the primary haul roads and are scheduled to be moved every ten years or so, in accordance with the requirements of the mining schedule and the location of ore as the mines progress. This crusher movement is planned well in advance and is treated as sustaining capital expenditure.

The crushers would be regarded as on relatively light duty for a mining operation and are well maintained. Similarly, the conveyors, which operate all year round and are covered, negating any potential effect of weather.

Figure 13-6: Covered Conveyor (SLR, 2021)

Both the crushers and conveyors were observed to be in excellent condition and subject to scheduled maintenance, including replacement of conveyor belts.

Alcoa plans additional stockpiling compared to the historical direct feed mine to crusher operation as part of the LTMP 2025. In this change stockpiling and reclaim will be utilized to smooth feed grade to the crushers from the variable grades to be mined. Whilst adding a marginal operating cost for the rehandle it is envisaged this provides a cost benefit in completely mining out pits rather than having to return periodically as grade dictated previously.

Other ancillary equipment includes offices, ablutions, crib-rooms, and workshops, all of which were observed to be in excellent condition.

13.3 Geotechnical and Hydrogeology Considerations

Based on their long operating history, Alcoa's approach to mine stability has largely been based on strong pit performance. Mining at Alcoa's Darling Range operations is very shallow, pits being an average of 4 m deep. Consequently, geotechnical considerations are negligible other than immaterial localized batter failures. Similarly, the mining areas are elevated and well drained and groundwater and surface water hydrology is not material in these areas other than the catchment, impoundment, and decantation of runoff during the wet winter months. No drainage diversion occurs or is necessary because the mineralization sits between the stream beds and the bauxite occurs above the groundwater table. Deeper bauxite may be seasonally affected by the water table and is scheduled to be mined in summer. Backfilling of these places occurs before the rain raises the water table.

Contour mining (Figure 13-7) is practiced in areas of relatively steep topography, maintaining access ramps at less than 1:8 gradient and mining across the contour and downwards, creating a flat working floor. Hydrological considerations in these areas include management of runoff during the wet winter months and trafficability.

Mine overburden is progressively backfilled into adjacent exhausted pits (Figure 13-8), topsoiled, landscaped (Figure 13-9), and rehabilitated by re-establishment of native

vegetation (Figure 13-10), creating a stable post-mining landform that replicates the pre-existing environment. Recommended pit design constraints are shown in Table 13-1.

Table 13-1: Alcoa Recommended Pit Design Constraints

Feature	Constraint
Pit total void Crest/Toe offset	0.15m
Maximum floor cut for a digger	4m. Recommended 3.5m
Maximum floor cut for a loader (depending on loader size)	7m. Recommended 6m (depending on loader size)
Dozer Push	Recommended 50m but can be dependent on the pit and extraction
Minimum Cut depth (non terrace)	Huntly 2m, WDL 1.5m
Maximum Cut depth before a berm	8m cut, then a 7.5m berm is required
Offset to Non blasted ground	7.5m

WSP-Golder were engaged by Alcoa to undertake a desktop study and gap analyses in February 2023 as part of broader scope to develop a ground control management plan for their Huntly and Willowdale operations. As part of the study, critical geotechnical hazards were identified with any associated failure mechanisms. These include rock fall, excavator stability whilst loading, dump / stockpile stability and land slips / rotational failure of batters. Surface water and groundwater are closely interlinked and are considered a major trigger for initiating all of these events. A geotechnical training package has been developed in order to provide training to mine operating staff. Ideally, all employees should be able to identify warning signals and are responsible for making the mine a safe place to work. All hazards are site specific related to Huntly and Willowdale operations. Recommendations for controls have been provided and can be applied as part of standard work procedures.

Alcoa mines areas of both flatter and steeper terrain, adopting higher walls and multi batter slopes where gradients are higher. It is recommended material strength characterization and stability analyses are continually investigated in particular for areas with planned high walls. A forward work plan with more detailed recommendations is available.

Figure 13-7: Contour Mining (SLR, 2021)

Figure 13-8: Soil Being Returned for Backfilling and Landscaping the Pit (Alcoa, 2018)

Figure 13-9: Landscaped Mining Area, Prior to Replanting of Forest (SLR, 2021)

Figure 13-10: Rehabilitated Pit Through Re-plantation of Native Vegetation (SLR, 2021)

13.4 Mine Equipment

Mining is undertaken by 250 t and 200 t-class excavators top-loading 140 t and 190 t capacity rigid-bodied mining trucks (Figure 13-11). This fleet was observed by the QP at Huntly to be aged. The equipment has undergone relatively light duties for a mining fleet, which prolongs its life. Sustaining capital is being invested in equipment replacement and modernization at Willowdale, progressively working toward Huntly. New equipment includes 250 t-class excavators and 140 t-class trucks.

A full list of equipment at Darling Range is provided in Table 13-2.

Figure 13-11: Ore Mining at Darling Range (SLR, 2021)

Table 13-2: Darling Range Operations Equipment List

Location	Classification	Type	No. Units
Huntly	Primary	Excavator	6x CAT 336D 2x Komatsu PC3000 3x Komatsu PC2000 4x Hitachi 2600-7
		Haul truck 1	8x CAT 789C (190T) 9x CAT 789D (190T) 4x Komatsu HD 1500

	Ancillary	Bulldozer / Loader	3x CAT D11R 3x Komatsu 475 2x Komatsu 375 1x CAT 992K 2x CAT 993K 2x CAT 980 Loaders
		Grader	2x CAT 16M 1x CAT 24M
		Scrapers	5x CAT 637G
		Low Loaders	1x CAT 785D (220T) 1x CAT 793 (450T) 1x CAT 785C (175T)
		Water truck	3x CAT 785C
		Drills	3x Epiroc D50 (Blast) 5x WB93 (Exploration)
Willowdale	Primary	Excavator	2x Hitachi ZX360 2x CAT 336D 1x Komatsu PC2000 2x Komatsu PC3400
		Haul truck 1	6x Komatsu 730E (190T)
	Ancillary	Bulldozer / Loader	3x CAT D11T 1x Komatsu 475 2x CAT 993K 2x Komatsu WA320
		Grader	1x CAT 16H 1x CAT 18M
		Scrapers	3x CAT 637K 1x CAT 637G
		Low Loaders	1x CAT 793 (450T)
		Water truck	2x CAT 777F 2x Komatsu 730E
		Drills	3x Epiroc D50 (Blast)

13.4.1 Contractors

Alcoa's practice in noise sensitive areas such as the perimeter of the operation near residents is to engage contractors. These areas operate on day shift only and attract higher operating costs than the main production areas. The flexibility required in these areas precludes the use of the primary owner-operator fleet and equipment is dry or wet hired or mining takes place under conventional schedule of rates contracts.

Alcoa also engages contractors for aspects of haul road construction services, in select areas of pit development, and during landscaping activities for rehabilitation after mining.

This practice has led to the establishment of a secondary contracting industry around the Darling Range operations. Contractors are overseen by Alcoa personnel.

13.4.2 Ancillary Equipment

Ancillary equipment at Alcoa's Darling Range operations includes a fleet of bulldozers, graders and loaders that are primarily used for haul road formation, pit development (for the removal of overburden and blasted caprock) and ground preparation for digging, landscaping, clean-up, and road maintenance.

The SOBR process requires small excavators, articulated trucks, scrapers, and specialist skills to grub organic-containing clay from the top of the mineralization.

Figure 13-12: Blasthole Drill Working on Hardcap (SLR, 2021)

All ancillary equipment was observed to be in good and well-maintained conditions, the conditions being relatively light duty in comparison to other Western Australian mining operations. The current mining areas are shown in Figure 13-2.

13.5 Personnel

The main production mining operations are primarily Owner-operated using Alcoa equipment and employees. Contractors are also used for certain activities on site.

Three unions are recognized at the operations:

- The Australian Workers Union (AWU), which covers most of the operations workers
- Australian Metal Workers Union (AMWU), which covers the metal trades, being fitters, boilermakers and mechanics
- Electrical Trades Union (ETU), which covers the electricians

Lost time during strikes is generally uncommon. The Enterprise Agreements (EA) have varied timing for expiration. The AMWU Agreement, negotiated in early 2023, will expire in

April 2027. The ETU EA was negotiated at the end of 2021, with a 4 year term and the AWU Agreement was negotiated in the fourth quarter of 2023, with a 2.5 year term.

Alcoa's Darling Range operations were observed to have a stable workforce, drawn from the surrounding areas. The location is highly desirable in the Western Australian mining context and skilled personnel are readily attracted to the operations. Primary haul roads are named after personnel with greater than forty years' service and there are many of these.

Employee turnover is below industry standard, as the drive in, drive out nature of the work attracts many to work at Alcoa.

As of December 2024, the Huntly and Willowdale operations together employ 981 employees consisting of 36 technical, 122 management and 823 operations employees. Additionally, 171 employees are centrally employed on the combined operations.

A breakdown is shown in Table 13-3 (current vacancies not accounted for).

Table 13-3: Darling Range Personnel

Location	Classification	No Personnel
Huntly 661	Technical	24
	Management	71
	Operations	566
Willowdale 320	Technical	12
	Management	51
	Operations	257
Central 171	Technical	46
	Management	21
	Operations	104
Total		**1152**

14.0 Processing and Recovery Methods

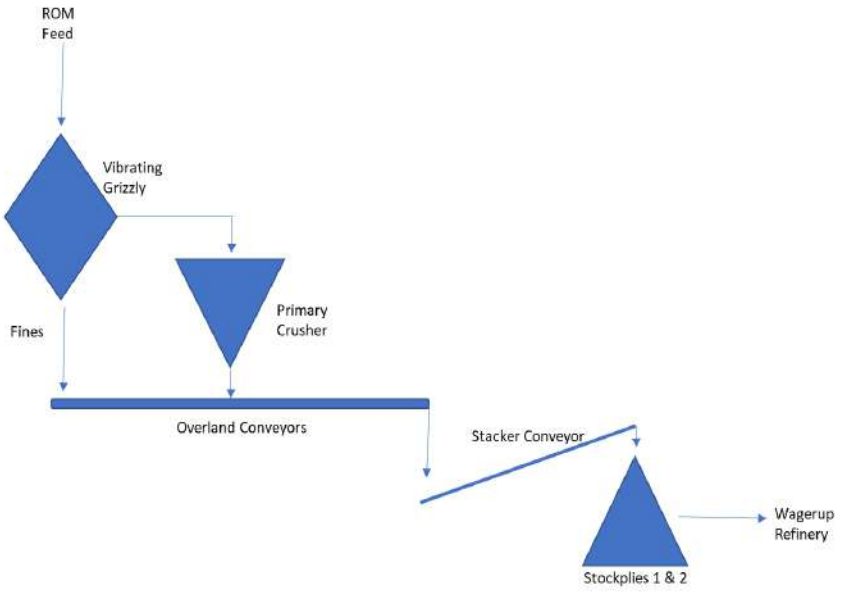
14.1 Process Description

The process plant for the Darling Range operations consists of two separate crushing facilities at the Huntly and Willowdale mines. Both facilities crush the ROM and convey the crushed ore to two separate refineries.

The Willowdale operation consists of a single stage crushing flowsheet and includes a series of conveyors to transport the crushed ore at an annual throughput of 10 Mtpa. The ROM is discharged from trucks on a dump hopper. An apron feeder transfers the ore from the dump hopper to a vibrating grizzly with an aperture of 180 mm. The grizzly oversize is discharged into a single toggle jaw crusher which crushes the ore to a top size of 180 mm. A hydraulic rock breaker is installed at the crusher to break the larger rocks that do not pass through the crusher opening. The crushed product and the grizzly undersize are discharged on to a discharge conveyor and subsequently discharged on to an overland conveyor. The discharge conveyor is fitted with a tramp magnet to remove any metal that is present along with the crushed ore product. The overland conveyor, which is 9.4 km long, transports the crushed ore to an intermediate transfer station. The ore is then transported by a second overland conveyor, 8.8 km long, to the transfer station located at Wagerup. An apron feeder is used to transfer the crushed ore from the Wagerup transfer station on to a stockpile conveyor and subsequently discharge on a stacker conveyor. The stacker conveyor discharges the ore into two separate stockpiles. The crushed ore is then reclaimed from there for processing in the Wagerup refinery. The total capacity of the stockpiles is approximately 0.7 Mt and sufficient for three weeks of feed to the refinery.

A simplified block flow diagram of the Willowdale operation is shown in Figure 14-1.

Figure 14-1: Simplified Block Flow Diagram of the Willowdale Operation



The Huntly operation consists of multiple stages of crushing and includes a series of conveyors to transport the crushed ore to the refinery at an annual throughput of 17 Mtpa. The primary crushing is achieved by two similar crushing circuits operating in a parallel

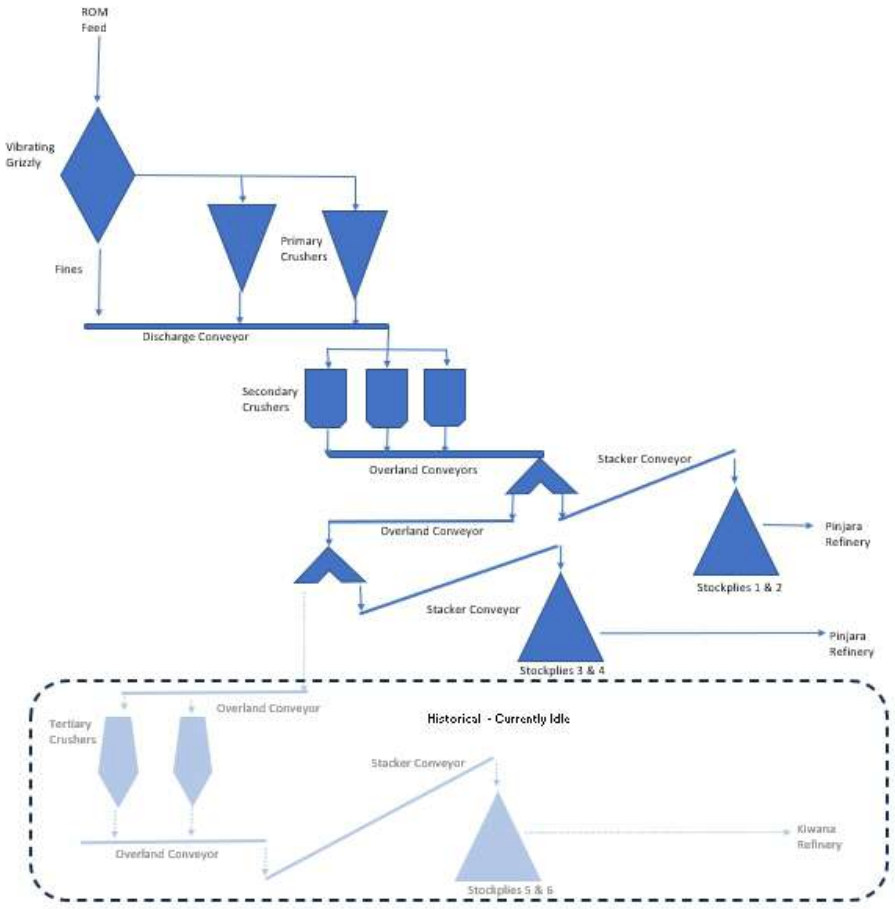
configuration. The ROM is discharged from trucks on dump hoppers. Apron feeders transfer the ore from the dump hopper to vibrating grizzlies with an aperture of 180 mm. The grizzly oversize fractions are fed to jaw crushers which crush the ore to a top size of 200 mm. The crushed product and the grizzly undersize are discharged on to discharge conveyors and transferred to the secondary crushers (sizers). The discharge conveyors are each fitted with a tramp magnet to remove any metal that is present in the crushed ore. Secondary crushing is achieved in sizers with the objective of reducing the ore particle size to a top size of 100 mm. The secondary crusher product is transported by three overland conveyors (operating in series with two intermediate transfer stations in between) to a transfer station and randomly split into two by a splitter bin.

One fraction from the splitter bin is transferred by another overland conveyor and discharged into a stockpile conveyor via an apron feeder. The stockpile conveyor transfers the ore and subsequently discharges onto a stacker conveyor. The stacker conveyor discharges the ore into two separate stockpiles identified as Stockpile 1 and Stockpile 2. The crushed ore is then reclaimed from there for processing in the Pinjarra refinery. The second fraction of the ore is transported by an overland conveyor to an apron feeder, to a transfer conveyor and then to an adjustable splitter chute located at a separate transfer station. One of the splits from the splitter chute previously led to the Kwinana refinery, prior to curtailment in Q2 2024. Currently the whole stream is destined for Pinjarra refinery.

The fraction for the Pinjarra refinery is transported by stockpile conveyor and subsequently discharged on to two sperate stockpiles (identified as Stockpile 3 and Stockpile 4) via a stacker conveyor. The ore is then reclaimed from the stockpiles for processing in Pinjarra refinery along with the ore from Stockpile 1 and Stockpile 2.

The split for Kwinana refinery was transported by a conveyor and processed by a tertiary crushing circuit consisting of two roller crushers operating in parallel configuration. The tertiary crusher product with a top size of 25 mm was transferred by a stockpile conveyor and discharged into two separate stockpiles identified as Stockpile 5 and Stockpile 6 via a stacker conveyor. The crushed ore from Stockpiles 5 and Stockpile 6 was then reclaimed and transferred by a reclaim conveyor to a surge bin for subsequent loading and transport to the refinery by train. This section (System 4) was put into care and maintenance following the curtailment of Kwinana. A simplified block flow diagram of the full Huntly operation, prior to Kwinana curtailment, is shown in Figure 14-2.

Figure 14-2: Simplified Block Flow Diagram of the Huntly Operation



** System 4 of the flowsheet above is currently on care and maintenance following curtailment of the Kwinana refinery. The supply to Pinjarra remains as previous.*

14.2 Primary Equipment List

The primary equipment lists of the full Willowdale and Huntly operations are shown in Table 14-1 and Table 14-2.

Table 14-1: Primary Equipment List (Willowdale)

Equipment	Quantity	Installed Power (kW)
Apron feeder	1	264
Vibrating grizzly	1	75
Primary Crusher	1	355
Discharge conveyor	1	132
Overland conveyor	1	2500

Overland conveyor	1	1800
Apron feeder	1	75
Stockpile conveyor	1	300
Stacker boom conveyor	1	110

Table 14-2: Primary Equipment List (Huntly)

Equipment	Quantity	Installed Power (kW)
Apron feeder	1	260
Vibrating grizzly	1	55
Primary Crusher	1	250
Discharge conveyor	1	140
Secondary crusher	1	1000
Apron feeder	1	260
Vibrating grizzly	1	75
Primary Crusher	1	250
Discharge conveyor	1	140
Secondary crusher	1	1000
Overland conveyor	1	7500
Overland conveyor	1	5000
Overland conveyor	1	6100
Apron feeder	1	75
Overland conveyor	1	1500
Apron feeder	1	55
Apron feeder	1	75
Overland conveyor	1	1350
Apron feeder	1	110
Stockpile conveyor	1	225
Stacker boom conveyor	1	110
Yard conveyor*	1	250
Stockpile conveyor*	1	150
Stacker boom conveyor*	1	110
Conveyor*	1	250
Apron feeder*	1	75
Tertiary crusher*	1	370
Apron feeder*	1	75
Tertiary crusher*	1	370
Stockpile conveyor*	1	300
Stockpile boom conveyor*	1	110
Bucket wheel reclaimer*	1	264

Reclaim bridge conveyor*	1	110
Transfer conveyor*	1	280
Reclaim conveyor*	1	280
Reclaim conveyor*	1	900

** These items are associated with System 4, which is currently on care and maintenance following curtailment of the Kwinana refinery.*

14.3 Consumables and Power

The power consumption of the Huntly operation is approximately 5,500 MWh to 6,500 MWh per month. The Willowdale power consumption is approximately 2,000 MWh per month.

The process plant is a dry crushing operation and therefore water is only required for dust suppression and is included as part of mine water consumption. Water is not required as a consumable for the plant.

Other consumables of the process plant include crusher liners, screen panels and spares for feeders and conveyors. These are kept on site and replaced as part of the routine maintenance schedule according to manufacturer's guidelines.

Personnel requirements for the operation and maintenance of the plant as described are included in Table 13-3.

14.4 QP Opinion

The QP is of the opinion that the selected processing method and the flowsheet are suitable for Darling Range operations. It is important to note that the ore head grades meet the refinery specifications for processing in terms of Al_2O_3 grades and SiO_2 grades, this means the ore can be directly shipped to the refineries for further processing without any upgrading in the mineral processing plant. The crushing circuit reduces the particle size suitable for conveying as well as to meet particle size specified by the refineries.

15.0 Infrastructure

The infrastructure for the mining operations is established and operational. In 2021, the infrastructure hub for Willowdale was relocated 16 km southwards from Orion (after having been based there for 21 years) to the Larego Hub which is located about 20 km north-east of the town of Harvey. The hub hosts administrative offices, as well as crushing facilities and maintenance facilities. The Orion Hub site is currently being rehabilitated with planning for infrastructure decommissioning commencing in 2025.

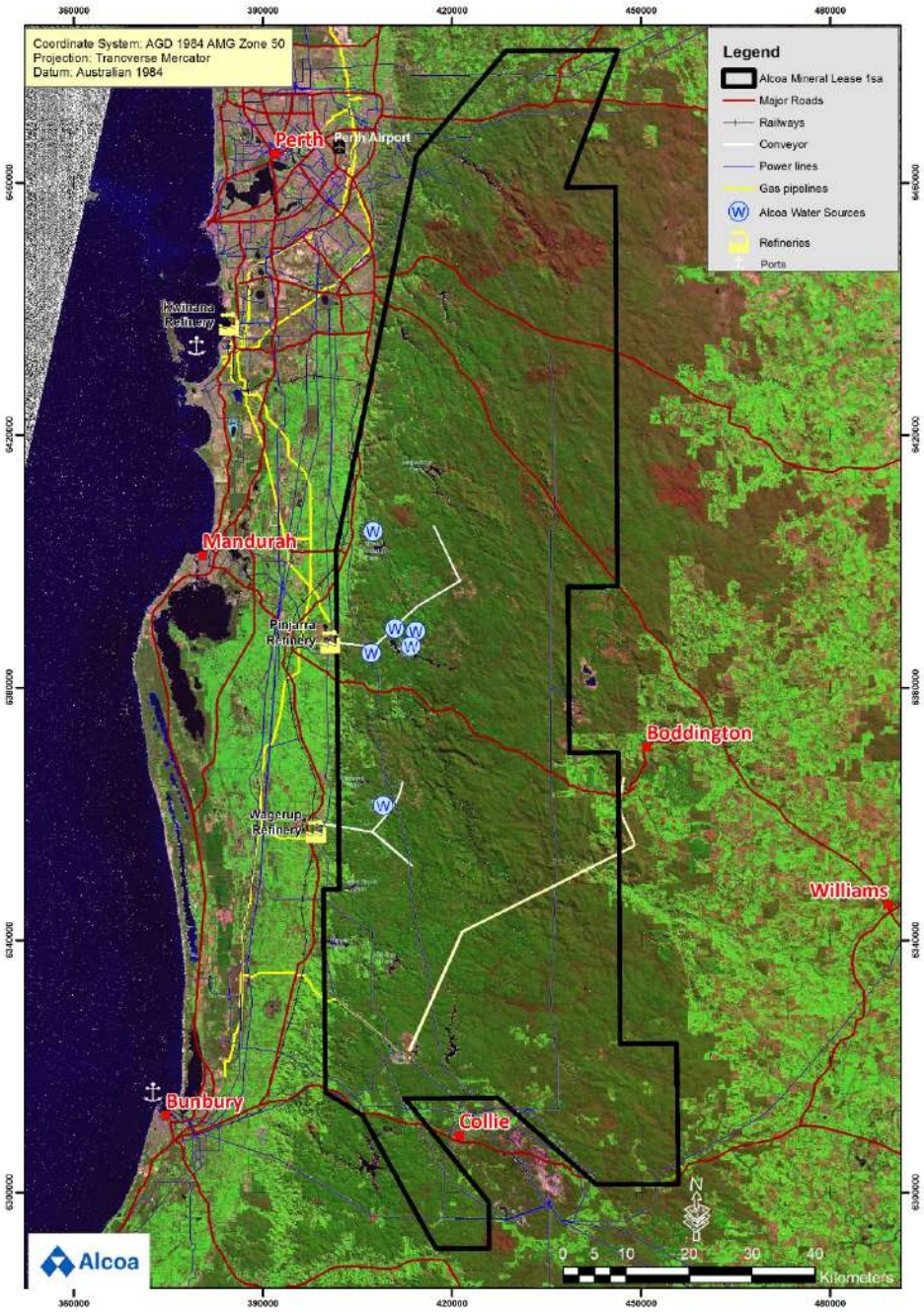
The mining hubs are relocated periodically as production moves away from the hub and thus transportation costs increase. Alcoa plans for the Larego Hub to be in place for approximately 20 years, though this is the fourth relocation since the mines opened in the 1970s/80s (approximately 13 years on average). The mining hub relocations are well-understood with planning and associated budgeting occurring well in advance of relocations; production restarted seven days after the most recent shutdown.

An extensive haul road network, rail, and overland conveyors are able to transport crushed bauxite from the Hub to the refineries on the coast (namely Kwinana, Wagerup and Pinjarra). As announced in January 2024, the Kwinana refinery ceased production in the second quarter of 2024 following phased curtailment; with the associated mine plans being revised accordingly.

Bauxite is transferred from each mine to Wagerup and Pinjarra primarily via long distance conveyor belt. Rail transport of bauxite to the curtailed Kwinana refinery is also possible. The Alumina produced by the refineries is then shipped to external and internal smelter customers through the Kwinana and Bunbury ports.

The infrastructure layout for the Darling Range operations is shown below (Figure 15-1).

Figure 15-1: Infrastructure Layout (Alcoa, 2022)



15.1 Access Roads

The Darling Range is readily accessible via road from Perth and surrounding areas. The mines are near the towns of Pinjarra and Waroona. Both towns are easily accessible via the national South Western Highway, a sealed single carriageway road, which starts on the southern side of Perth and continues for almost 400 km to the southwest corner of Western Australia.

The Huntly mining area is accessible from the South Western Highway via Del Park Road, a sealed single carriageway road which connects the town of North Dandalup in the north with Dwellingup in the south. From Del Park Road, a further sealed road which follows the route of the bauxite conveyor to the Pinjarra refinery provides access to the Huntly site.

The Willowdale mining area is similarly accessible from the South Western Highway via Willowdale Road, a sealed single carriageway road to the south of Waroona.

Major haul roads have been established to each mining area. Roads are unsealed and require continuous ongoing maintenance which was observed during the site visit. Secondary haul roads, also unsealed, cross-cut each individual mining plateau.

15.2 Power

The Darling Range's Pinjarra refinery receives power from the South West Interconnected System (SWIS). The refinery also has internal generation capacity of 100 MW from 4 steam driven turbine alternators, with steam produced by gas fired boilers and a gas turbine Heat Recovery Steam Generator (HRSG). The refinery supplies power to the Huntly Mine by three different power supply lines (a single 33 kV and two 13.8 kV).

Willowdale Mine has a single 22 kV power supply fed from the Wagerup refinery. The Wagerup refinery is a net exporter of power to the SWIS, with internal generation capacity of 108 MW from three steam driven turbine alternators and one gas turbine. The steam is produced by gas fired boilers.

The power consumption of the Huntly operation is approximately 5,500 MWh to 6,500 MWh per month. The Willowdale power consumption is approximately 2,000 MWh per month.

15.3 Water

Water is used on the mines for dust suppression, dieback washdown, vehicle washdown, workshops, conveyor belt wash, construction, and domestic purposes. The water supplies for mining consist of licensed surface water sources supplemented with treated wastewater from vehicle washdowns, stormwater runoff and maintenance workshops.

The WA mines are licensed by the Department of Water and Environmental Regulation (DWER) to draw surface water from five locations to meet their water supply requirements. The Huntly mine draws water from Banksiadale Dam and Boronia Waterhole. Huntly mine also holds a license to draw water from Pig Swamp and Marrinup, however these resources are retained as a backup water supply and have not been utilized in recent years. Huntly mine is also permitted to draw water from South Dandalup Dam under an agreement with the Water Corporation. A pumpback facility from South Dandalup Dam to Banksiadale Dam is used to raise levels in Banksiadale Dam during periods of low rainfall runoff. Willowdale Mine draws water from Samson Dam.

Table 15-1 summarizes the license allocation for water usage. In 2023, water abstraction comprised approximately:

- 4.2% of the annual entitlement from Boronia Dam
- 22% from Banksiadale Dam
- 82% from Samson Dam.

An additional 126,306 kL was also abstracted from South Dandalup Dam under the agreement with Water Corporation.

Table 15-1: Water Abstraction License Volumes

Site	Water Source	Surface Water License	Annual Water Entitlement
Huntly	South Dandalup Dam	N/A	N/A
Huntly	Banksiadale Dam	SWL63409	500,000
Huntly	Pig Swamp Waterhole	SWL153635	30,000
Huntly	Boronia Waterholeon Marrinup Brook	SWL83356	70,000
Marrinup Nursery	Lot 908 on Marrinup Brook	SWL68893	45,000
Willowdale	Samson Dam	SWL61024	450,000

15.4 Accommodation Camp

There are no Alcoa accommodation facilities within the Darling Range. As described above, the Huntly and Willowdale mining areas are within proximity to established population centers including Pinjarra approximately 30 km to the southwest of Huntly and Waroona approximately 20 km northwest of Willowdale.

On site facilities includes offices, ablutions, crib-rooms, and workshops, all of which were observed to be in excellent condition.

15.5 Mine Waste Management

15.5.1 Tailings Disposal

No tailings are generated within the boundaries of the mining operations. The management of tailings generated downstream at the refineries is beyond the boundaries of the Darling Range mining operations and are therefore not considered in this TRS.

15.5.2 Waste Rock Disposal

Alcoa's Darling Range mining operations do not produce mine waste or "mullock" in the same manner as conventional mining operations and waste dumps are not constructed.

Topsoil and overburden from Darling Range ore blocks is carefully segregated for later rehabilitation of adjacent, completed mining operations. Overburden is used to backfill these shallow, completed pits and the topsoil spread on top and contoured. Maximum slopes (angle and length) are defined in the Completion Criteria. If topsoil has been harvested and stored for up to three months prior to use as a rehabilitation input it is considered 'direct-return' and seeding may not be undertaken. If it is older than 3 months, it is considered 'fallow' and requires seeding. Nursery-raised seedlings are also used in rehabilitated areas.

To date, some 20,000 ha of mined areas have been backfilled and reforested, which represents around 75% of the area mined since 1966, including areas reserved for long-term infrastructure. Rehabilitation standards are described in Alcoa's 2016 statutory Bauxite Mine Rehabilitation Completion Criteria. These completion criteria have been progressively revised since inception in the 1990s.

16.0 Market Studies

16.1 Overview

Alcoa Corporation is a vertically integrated aluminum company comprising bauxite mining, alumina refining, aluminum production (smelting and casting), and energy generation.

Through direct and indirect ownership, Alcoa Corporation has 27 locations in nine countries around the world, situated primarily in Australia, Brazil, Canada, Iceland, Norway, Spain, and the United States. Governmental policies, laws and regulations, and other economic factors, including inflation and fluctuations in foreign currency exchange rates and interest rates, affect the results of operations in these countries.

There are three commodities in the vertically integrated system: bauxite, alumina, and aluminum, with each having their own market and related price and impacted by their own market fundamentals. Bauxite, which contains various aluminum hydroxide minerals, is the principal raw material used to produce alumina. Bauxite is refined using the Bayer process to produce alumina, a compound of aluminum and oxygen, which in turn is the raw material used by smelters to produce aluminum metal.

Alcoa obtains bauxite from its own resources and processes over 80% of its combined bauxite production into alumina. The remainder is sold to the third-party market.

Aluminum is a commodity that is traded freely on the London Metal Exchange (LME) and priced daily. Pricing for primary aluminum products is typically composed of three components:

i. The published LME aluminum price for commodity grade P1020 aluminum;

ii. The published regional premium applicable to the delivery locale; and

iii. A negotiated product premium that accounts for factors such as shape and alloy.

Further, alumina is subject to market pricing through the Alumina Price Index (API), which is calculated by the Company based on the weighted average of a prior month's daily spot prices published by the following three indices: CRU Metallurgical Grade Alumina Price; Platts Metals Daily Alumina PAX Price; and Metal Bulletin Non-Ferrous Metals Alumina Index. As a result, the price of both aluminum and alumina is subject to significant volatility and, therefore, influences the operating results of Alcoa Corporation.

Unlike alumina and aluminum, bauxite is not a standard commodity traded on an index. Bauxite's grades and characteristics vary significantly by deposit location and the value of bauxite deposits for each downstream refinery could be different, based upon:

- refinery technology;
- the location of each refinery in relation to the ore deposit; and
- the cost of related raw materials to each refinery.

As such, there is no widely accepted index for bauxite. Most bauxite traded on the third-party market is priced using a value-in-use methodology. The key assumption for the value-in-use methodology is that both the (1) offered bauxite and the (2) comparative bauxite being used in the target refinery will generate the same refining cost. As such, using the known price for the comparative bauxite used in the target refinery, the offered bauxite price will then be derived by considering the bauxite characteristics and quality differences between the offered and comparative bauxite.

16.1.1 Market Fundamentals

Bauxite is the principal ore of alumina (Al_2O_3), which is used to produce aluminum. Bauxite mining and alumina refining are the upstream operations of primary aluminum production.

China is the largest third-party seaborne bauxite market and accounts for more than 90% of all bauxite traded. Bauxite is sourced primarily from Guinea and Australia on the third-party market. In the long run, China is expected to continue to be the largest consumer of third-party bauxite with Guinea expected to be the majority supplier. Further, third-party traded bauxite is expected to be tight over the next decade, driven by China demand together with new supplies coming from Guinea.

Bauxite characteristics and variations in quality heavily impact the selection of refining technology and refinery operating cost. A market bauxite with high impurities could limit the customer volume an existing refinery could use, resulting in a discount applied to the value-in-use price basis.

Besides quality and geography, market fundamentals, including macroeconomic trends – the prices of raw materials, like caustic soda and energy, the prices of Alumina and Aluminum, and the cost of freight – will also play a role in bauxite prices.

16.2 Market: Darling Range

16.2.1 Operation

The Darling Range mines are part of an integrated operation of two mines, three refineries and two ports. Subsequent to 2021, production from the Darling Range mines (Huntly and Willowdale) was used exclusively for consumption by the integrated refineries.

Bauxite is transferred from each mine to the refineries primarily via long distance conveyor belt, apart from the Kwinana refinery, which receives bauxite via railway. The Alumina produced by the three refineries is then shipped to external and internal smelter customers through two ports, based in Kwinana and Bunbury.

As intended, the Kwinana refinery ceased production in the second quarter of 2024 following phased curtailment. The updated mine plans have been revised accordingly.

16.2.2 Pricing

In 2016, Darling Range entered into a 5-year third-party sales contract with a major alumina producer in China. Following the expiration of the third-party sales contract at the end of 2021, all bauxite production from Huntly and Willowdale was consumed internally by Alcoa refineries.

The pricing mechanism of the third-party sales contract was based on a value-in-use methodology (as described in Section 16.1) that was anchored to the customer’s other bauxite sources at the time of execution, with a market adjustment factor linked to the alumina price.

Alcoa determines economic cut-off grade by deducting operational costs (mining, refining etc) from a base alumina price of USD 400 per tonne. This approach is described in more detail in Section 12.7.

As per previous disclosures, the bauxite price utilized in the mine cashflow is represented by an intercompany price, indicative of mine sales to the refinery, inflated by 3% YoY. The weighted average of this price is $23.19/t over the detailed mine plan period of nine years.

16.3 Contracts

All Darling Range production is shipped via conveyor to one of the Alcoa's Pinjarra and Wagerup refineries.

Material operational contracts that are in place include:

- Harvesting and Clearing contracts: Alcoa has long term contracts with third party suppliers to harvest and clear the forecast prior to development for mining. Pricing is based on fixed rate schedules, payable either per hectare or on equipment hire and labor hire rates.
- Rehabilitation contracts: Alcoa has long-term contractual agreements with third-party suppliers to rehabilitate certain mined areas, ready for closure. Pricing is based on fixed rate schedules, payable either per hectare or on equipment and labor hire rates.
- Fuel contract: Alcoa has a mid-term contractual agreement with a third-party to supply diesel fuel for mining operations. Pricing is based on market pricing for diesel, payable on volume consumed.

These types of contracts are typical of other similar mining operations.

17.0 Environmental Studies, Permitting, and Plans, Negotiations, or Agreements with Local Individuals or Groups

17.1 Environmental Studies

17.1.1 Existing Operations

Alcoa has established practices and processes for enabling conformance to environmental requirements. Sensitive areas are identified and managed ahead of disturbance. Environmental factors are considered prior to infill drilling; hence, mining blocks carrying environmental risks do not feature in the Mineral Reserves (for example, areas around granite outcrops and water courses have a buffer applied and are considered no-go areas from a mining perspective). Mining in some areas became more constrained in 2023 as a result of internal and external factors; these constraints continued through 2024 and are associated with:

- Alcoa's ongoing consultation with key stakeholders including the EPA, ITAG and BSEC (previously MMPLG)
- Approval conditions of the 2023-2027 MMP (these were copied across into the October 2024 roll-over approval now covering 2024-28)
- Conditions associated with the *Environmental Protection (Darling Range Bauxite Mining Proposals) Exemption Order 2023*
- Alcoa's progress on the EP and EPBC Act assessment (beyond the scope of the MMP) to increase refinery production by 5% through the transition of mining from Huntly to the Myara North and Holyoake areas, as described in Section 3.6.

The Final 2023-2027 MMP was developed by Alcoa and approved by the Minister for State Development in December 2023. It excludes an environmental assessment of mine development activities associated with the Myara North and Holyoake mining regions currently under consideration by the EPA and DCCEEW (section 17.1.2). The MMP describes Alcoa's proposed mining operations for the Huntly and Willowdale mines within ML1SA from 1 January 2023 to 31 December 2027. For example, Alcoa undertakes surveys to inform the mine plan development, characterization of ore quality and volumes, assess geotechnical conditions, identify constraints and protect or manage important environmental, cultural heritage and social values. Surveys include:

- Vegetation mapping to delineate vegetation community types, ensure clearing does not have cumulative impacts on underrepresented species assemblages and identify critical habitat for known threatened species.
- Establishment of forest reference vegetation monitoring plots to enable representative comparison with post-mining rehabilitation. Mean species richness of forest reference sites is utilized to measure the effectiveness of rehabilitation.
- Black cockatoo surveys to locate trees that will be protected from disturbance, to minimize impact on these species. All nest trees and significant trees (as defined under technical guidance from the DCCEEW) are conserved with a buffer wherever they occur in the landscape. Habitat trees are conserved on haul road alignments, where the alignment can be adjusted to avoid these trees.
- Assessment of Phytophthora dieback to inform activities which may cause soil disturbance, to manage dieback soils and prevent contamination of dieback free areas. This data is also utilized in soil movement and rehabilitation planning.

- Baseline hydrology data acquisition to inform detailed design of mine pit and infrastructure.

As reported in the 2023 TRS, the current restrictions on mining while the EPA assesses the 2023-2027 MMP and Alcoa continues to operate under the Exemption Order include but are not limited to:

- Reduce mining activities inside higher risk areas within drinking water catchments.
- Alcoa will not undertake any new pit clearing in any areas with an average pit slope greater than 16% within any Reservoir Protection Zone (RPZ, 2 km from reservoir top water level).
- Increase rehabilitation and reduce open areas where possible, with priority in higher risk areas.
- Maximum annual clearing footprint of 800 ha.
- As required by Ministerial Condition 23, related to the 2023-2027 MMP, the draft rehabilitation criteria agreed between DBCA and Alcoa were submitted to the Minister for State Development on 19 December 2024 (due date was 31 December 2024). Alcoa is awaiting further review by BSEC; JTSI is yet to provide a timeframe for this (as of 20 December 2024)

These changes have resulted in a presumed temporary decrease in operability and associated decrease in Reserve estimation, future operating conditions may be different once the EPA assessment is complete for the 2022-2026 and 2023-2027 MMPs, and conditions on the subsequent Ministerial Statement are known. The MMP ESD states the EPA is aiming to complete its Assessment reports for the 2022-2026 MMP (assessment 2384) and 2023-2027 MMP (assessment 2385) in the third quarter of 2025. This timing is dependent on some factors that are within Alcoa's ability to influence, and some factors that are beyond Alcoa's ability to influence. The Ministerial Statement would follow from the EPA Report.

As reported in previous years, the threat of bushfires is the only significant naturally occurring risk identified to the Reserve estimation for existing operations.

Bushfire mitigation and firefighting activities within state forest are managed by the Department of Biodiversity Conservation and Attractions (DBCA). Alcoa maintains fire access tracks as required by the working arrangement with DBCA and complies with requirements of the Bushfires Act including seeking exemptions for certain activities during Total Fire Bans. Asset protection zones are not mandated although Alcoa does maintain them around infrastructure as per internal standards to mitigate risk. Alcoa owned private property is maintained to local government requirements as per the requirements of the Bushfire Act.

Bushfires have occurred in the past, but to date have not had a material impact on production.

Overall SLR is of the opinion that the current plans and well understood processes that are in train with the EPA (specifically EPA assessments 2384 and 2385) are considered adequate to address issues related environmental, social, and permitting risks. However, the timing of the EPA assessments is not wholly within Alcoa's control.

17.1.2 Future Mining Operations

Alcoa is modernizing its environmental approvals framework for its Huntly Bauxite Mine and Pinjarra Alumina Refinery, by self-referring future mining plans for assessment under Part IV of the Western Australian *Environmental Protection Act 1986* (EP) and the Australian *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The future mining plans that have currently been referred to both State and Federal departments

propose to transition the Huntly Mine into the proposed Myara North and Holyoake mine regions within Alcoa's Mining Lease ML1SA.

The Western Australian Environmental Protection Authority (State) has determined that the Pinjarra Alumina Refinery Revised Proposal (Assessment No. 2253), which includes the Huntly Bauxite Mine, will be assessed via a Public Environmental Review (PER).

Alcoa referred two separate Proposed Actions under the EPBC Act (Federal) for the following components:

- Huntly Bauxite Mine Transition – Myara North and Holyoake; and
- Pinjarra Alumina Refinery – development of water storage ponds and associated borrow pits.

The referred actions have been determined as Controlled Actions under the EPBC Act, and as such, require formal assessment.

In 2023, Alcoa proposed changes to the proposal while it was under assessment:

- Changes to the development envelope within which future activities will be contained
- Reduction in proposed disturbance within the overall Mine Development Envelope by 950 ha to total 8,323 ha
- Removal of the supply of 2.5 Mtpa of bauxite for export from the proposal scope.

The EPA has recognized:

- The reduction to the proposed disturbance and net reduction to the development envelope will decrease/avoid impacts to flora and vegetation, terrestrial fauna, inland waters and social surroundings.
- There are no new environmental factors likely to be significantly affected as a result of the amendments, and no additional EPA functions need to be performed to assess the amended proposal.
- The environmental review document to be released for public comment will be based on the proposal as amended.
- The amendment would not, if the proposal were already approved, be a significant amendment. In considering this, the effects of the amendment on its own, the effect of the amendment in the context of the existing referred proposal, cumulative and holistic impacts have been considered.
- The amended proposal will be substantially the same character as the existing referred proposal.

The EPA has enabled the altered proposal to be assessed as part of assessment 2253 already in progress. DCCEEW made a complementary decision and the assessment under the EPBC Act also continues.

The resulting Environmental Impact Assessments (EIAs) under State and Federal legislation will inform stakeholders on long-term mine plans and environmental management requirements and facilitate the setting of approval conditions.

As reported in the TRS for 2022 and 2023, numerous baseline studies have been completed to support approvals for future extensions to the mining footprint to the Myara North and Holyoake regions. Baseline studies are guided by the requirements of the Western Australian Environmental Protection Authority (EPA) and guidelines under the EPBC Act which are well understood. Studies have been undertaken to define the environmental values and constraints associated with:

- Flora and vegetation

- Short-range endemic vertebrates
- Aquatic and subterranean fauna
- Phytophthora dieback
- Terrestrial vertebrate fauna including Black Cockatoos
- Surface water
- Groundwater quality and dewatering drawdown
- Air quality
- Noise
- Landscape and visual impacts
- Historical and aboriginal heritage
- Greenhouse gas emissions.

Construction for Myara North will be commenced pursuant to the requirements of the Ministerial Decision, which will be issued upon completion of the EPA assessment process indicatively forecast for the first quarter of 2026, as opposed to approximately mid-2025 as reported in the TRS for 2023. Alcoa plans to commence construction, to facilitate the transition to Holyoake Central, from approximately 2028 and commence operation from approximately 2030, as reported in the MMP dated 10 November 2023. The timeframe to approval of Myara North and Holyoake under the EP and EPBC Act can be estimated, but not predicted with certainty; further delays are possible.

Supporting both the existing and future mining operations, additional environmental studies were further progressed in 2023 to identify regional environmental risks associated with low levels of PFAS in surface water catchments around the current and future Huntly and Willowdale operations. As is the case at most (if not all) mining operations in Western Australia, Per- and Poly-Fluoroalkyl Substances (PFAS) containing aqueous film-forming foams (AFFF) were used at Huntly and Willowdale Mines in vehicle fire suppression systems from approximately 2014 to 2021. Discharge of AFFF has occurred within the Operational Areas due to both testing and maintenance of fire suppression systems (at workshops) and activation (within Operational Areas) in response to vehicle fires or equipment malfunction. Alcoa reported areas around workshops at the Orion, Arundel, McCoy and Myara Operational Areas to the Department of Water and Environmental Regulation (DWER) under the obligations of the Contaminated Sites Act (2003) as possibly contaminated. These areas have subsequently been classified as *possibly contaminated – investigation required*. Stage 1 and 2 investigations have been endorsed by the DWER-appointed Contaminated Sites Auditor, a Stage 3 Detailed Site Investigation has been completed and submitted to the Auditor. Auditor comments are anticipated to be closed out and the report submitted to DWER in the first quarter of 2025. It is not unusual for these processes to take multiple years to complete alongside ongoing operations.

17.2 Waste and Tailings Disposal, Site Monitoring, and Water Management

17.2.1 Waste and Tailings Disposal

No tailings are generated within the boundaries of the mining operations as bauxite processing is undertaken at the refineries. Similarly, Alcoa's Darling Range mining operations do not produce mine waste or "mullock" in the same manner as conventional mining operations and as such waste dumps are not constructed.

Overburden from Darling Range ore blocks is carefully segregated for later contouring and rehabilitation of adjacent, completed mining operations. Caprock and other non-viable rock is used to backfill these shallow, completed pits and the viable topsoil is spread on top, contoured, and revegetated.

As such, there is no requirement for the monitoring of any tailings or mine waste dumps associated within the mining operations.

17.2.2 Site Monitoring

Alcoa's mine sites are monitored in accordance with conditions of Government authorizations and its operational licenses at Huntly (L6210/1991/10, last updated 09/02/21) and Willowdale (L6465/1989/10, last updated 20/02/24). The 2024 update at Willowdale was to enable:

- The construction and operation of a PFAS water treatment plant at Arundel mining area (further discussed later in this section).
- Upgrades to stormwater management at Arundel (new stormwater dams, oil-water separator and pipelined).
- Review of noise emissions from crushing infrastructure associated with move to Larego mining region.

Monitoring and reporting is also required under the approved 2023-2027 Mining and Management Program (2023-2027 MMP) and the *Environmental Protection (Darling Range Bauxite Mining Proposals) Exemption Order 2023*.

Environmental management and monitoring commitments exist for the following environmental aspects which have been assessed as being significant and therefore require operational controls as a minimum. The significant environmental aspects for which monitoring and/or management undertaken are:

- Discharge of environmental hazardous material outside of containment infrastructure; discharge response and dangerous goods storage. All underground storage tanks were previously removed from Alcoa's operations and are prohibited.
- Waste management and minimization.
- The management of mining within the lower rainfall zone to minimize risks of salinization of land and water resources.
- Surface water catchment protection for the nearby Public Drinking Water Source Areas (PDWSAs), including the exclusion of clearing, exploration, mining or other operations:
- within 1 km of the top water level of any water reservoir; or
- within the Serpentine Pipehead Dam Catchment;
- in any area with an average slope greater than 16% within the Reservoir Protection Zone of any water reservoir.

- Air emissions including:
- Smoke pollution associated with wood waste (although wood waste burning has now largely been phased out, with a small amount of burning in 2022 and no burning in 2023 and 2024)
- An ambient dust monitoring program to identify and quantify fugitive dust emissions from operating areas
- Ozone depleting substances
- Hazardous materials management including asbestos, synthetic mineral fiber, and polychlorinated biphenyls.
- Land including:
- Recordkeeping and Geographical Information System (GIS) mapping of the location and timing of all soil removal, landscaping, soil return, ripping and seeding
- Stabilization of cleared land post-mining and prior to rehabilitation
- Rehabilitation area monitoring to ensure the number of established plants meet the completion criteria targets associated with species richness, weed outbreaks and erosion
- Dieback management, mapping and field identification
- Forest and land clearing
- Flora and fauna, specific sensitivity and restrictions related to Black Cockatoos, including the exclusion of clearing, exploration, mining or other operations within 10 metres of any Black Cockatoo nesting trees or Black Cockatoo significant trees. Note this condition does not apply to the activities outlined in[1].
- Aboriginal and Historic (European) heritage
- Environmental value of national parks, nature reserves and native forests
- Visual amenity
- Noise.

Outcomes of and compliance with the management and monitoring programs are tracked within Alcoa's Environmental Management System and reported in monthly and annual reports to regulators including the BSEC (previously MMPLG) and DWER (at least annually, according to MMPLG requirements and Part V Licence requirements), the Minister for State Development (in accordance with the Exemption Order).

Review of the most recent report to JTSI – the Annual Environmental Review 2021-2023 (dated April 2024), largely reported compliance with environmental commitments and success of operational controls to managed environmental objectives. The following incidents were noted:

[1] These three restrictions do not apply to:

- stabilisation or rehabilitation activities; or
- environmental monitoring activities; or
- use and maintenance of existing infrastructure; or
- modification of existing road infrastructure with the written consent of the State Development Minister; or
- construction of drainage control infrastructure; or
- mining within 1 kilometre of the top water level of any water reservoir in Myara Central and Myara South carried out before 30 June 2024

- As reported in the previous TRS, Alcoa reported a potential heritage incident resulting from the installation of a groundwater monitoring bore within the recorded site boundary of MY08-11 to DPLH on 18 November 2022. This was also reported to Gnaala Karla Booja in parallel. An internal investigation into the incident was undertaken and Gnaala Karla Booja representatives undertook a site visit to the location on 19 January 2023. The results of the investigation and Gnaala Karla Booja consultation were provided to the DPLH on 20 February 2023. Alcoa has been advised that no further investigation will be undertaken by DPLH into this matter.
- There were no heritage incidents in 2023.
- No vegetation clearing incidents were reported in 2023.
- There were four dieback breaches at Huntly in 2021, seven in 2022 and four in 2023; two were the result of operator error and two resulted from surface water flows. Of the two that were related to surface water flows, one resulted from wash water build up against a trafficable hump causing the water to flow into a dieback free area. The other was caused by protective bunding deterioration allowing dieback wash water to flow into a dieback free stockpile. The remaining two events were the result of clean down procedures not being followed prior to entry to dieback free areas, and a dozer mistakenly tracking over the toe and around dieback free stockpiles as they were located close to the mine pit face. Upon further investigation of this final incident, it was found that the dieback free stockpiles had been compromised by wash water flowing from dieback stockpiles placed higher in profile with no drainage protection installed. This event led to 58.4 ha of stockpiles being downgraded. Corrective actions taken included a review of all dieback free stockpiles in GIS and then ground truthing to investigate any other potential dieback concerns. This was completed and further drainage and dieback protection was added to identified stockpiles.
- No dieback breaches occurred at Willowdale during 2022 and 2023. There were two breaches at Willowdale in 2021.
- No drainage events[2] were reported at Huntly in 2023 (two were reported in 2022); conversely two drainage events were reported at Willowdale in 2023 (none in 2022). Both 2023 events were related to the same 35.2 mm rainfall event, both were noted on 04 July and both were related to stormwater management (from separate sumps) at 374 Conveyor. Alcoa reported that neither event resulted in discharged water reaching a stream, neither were within an RPZ and neither resulted in a turbidity event at the nearest turbidity monitoring station.
- Failure of containment infrastructure events continued to show a down-ward trend across 2021 to 2023; Alcoa attributes this to both improved catchment protection and decreased annual rainfall across the period.
- At Huntly, the 2021-2022-2023 events decreased 51-11-8, respectively. For the eight events in 2023 at Huntly:
  - Five were outside the RPZ, three were inside;
  - Six of the events did not appear to reach a stream, the other two were both discharges from Deworboies 2 Rehabilitation Pit on 26 March and 26 April 2023, and comprised two of the three discharges within an RPZ. Alcoa provided information demonstrating that this pit had been contour ripped progressively up to February 2024, with aerial imagery captured on 29 March 2024 indicating ripping has been completed;

[2] A drainage event is defined under the approved 2023 – 2027 Mining and Management Program (MMP) as runoff from the mining disturbance footprint to the surrounding environment except where turbidity is measured below 25 nephelometric turbidity units (NTU).

- No turbidity event(s) were observed at the nearest downstream monitoring station for any of the failures.

- At Willowdale, the 2021-2022-2023 events decreased 20-7-1, respectively.
  - The event on 25 April 2023 at a sump on Conveyor 371 was within McKnoe's Brook Catchment and did not result in a turbidity event at the nearest downstream monitoring station. This site has a history of discharge events and failed mitigations. A review was undertaken and sumps were identified for construction/ redesign in the area. Construction was completed, and no drainage events were recorded throughout winter 2024.
- Into 2024, Alcoa reports it has further developed the risk assessment process to evaluate pit compliance to containing 1 in 100 year rainfall events. Its success, or otherwise, should be reviewed in a future TRS.
- The total annual spills (>20L) onto unsealed ground and total volume of such spills decreased from 2022 to 2023, as reported to JTSI in the triennial report (April 2024).
- In March 2023, DWER issued Alcoa a Prevention Notice (reference 202302) in relation to the PFAS pipeline constructed from Orion to the Arundel Pre-Treatment Dams. A related Prevention Notice was issued in May 2023 (reference 202304) specifying that Alcoa must not operate the PFAS pipeline, that PFAS containing wastewater must not be transferred or transported by any means across or within the Samson Brook catchment or Priority 1 Public Drinking Water Source Protection Area and a range of conditions for managing PFAS affected wastewater. Throughout winter 2024, Alcoa engaged Controlled Waste Carriers to transfer PFAS affected wastewater offsite to Cleanaway Henderson for treatment or to the Arundel Pre-Treatment Dams #1 and #2 in anticipation for the commissioning of the PFAS treatment unit (PTU). As noted at the beginning of this Section 17.2.2, Alcoa was granted a licence amendment from DWER in February 2024 approving the construction of the PTU at Arundel. At the time of writing, Alcoa is in the commissioning phase for the Arundel PTU and expects to complete commissioning early in 2025.
- Section 72 (s.72) of the Environmental Protection Act 1986 (EP) outlines the obligation to report discharges of waste to the environment if the discharge of waste has caused or is likely to cause pollution, material environmental harm or serious environmental harm. There were no incidents reported under s.72 in 2023, as was the case in 2022.

Alcoa is proactively working with relevant regulatory agencies to address operational incidents and implement operational improvements to reduce releases to the environment.

In addition, Alcoa provided the monthly reports for January to June 2024 required under Clause 10 of the 2023 Exemption Order, and verbally confirmed during meetings to inform this TRS, that no non-compliances had occurred. While not directly related to 2023 activities, the results are considered of interest given the importance of compliance with the Exemption Order to Alcoa's ongoing ability to operate while the EPA assesses the 2022-2026 and 2023-2027 MMPs.

17.2.3 Water Management

Alcoa implements a comprehensive water management and monitoring program in accordance with the requirements of its surface water and operational licenses, and also acts with a view of continuous improvement, particularly in relation to water which is a key operational and environmental consideration for the Darling Range. For example:

- Haul road sumps began being designed and constructed as per the WA Mining and Haul Road Drainage Design Manual. Upgrade works on identified priority sumps across both sites began in the summer of 2021/22 and continued in summer 2022/23 and 2023/24.
- Construction of the Arundel pre-treatment dams was completed in 2022 (50ML and 60ML lined dams), providing greater water storage capacity.
- As reported to JTSI in the 2023 Triennial report, Alcoa began installing groundwater monitoring bores in 2022 to facilitate assessment of groundwater levels and water quality in proposed mining areas. This process continues to occur on an ongoing basis to inform mine planning. 447 groundwater monitoring bores were installed across Huntly and Willowdale since the program began to the end of 2023. The boreholes are installed prior to mining to understand the baseline site conditions and interim groundwater levels and inform pit design. Biannual bore sampling to monitor groundwater quality and levels began in 2022. This program is ongoing with sampling planned to occur after each wet and dry season in April and September. Alcoa also aims to utilise groundwater level data obtained from the bores with rainfall records to understand the recharge from precipitation in the long term and to assess the groundwater response before, after and during mining operations.
- As reported in previous years, Alcoa has continued to develop its Catchment Risk Assessment tool to improve understanding of inherent and residual catchment risk associated with mining operations. Development of the tool is occurring in iterations to facilitate continual improvement during development and to improve accuracy. Iteration 2 of the Catchment Risk Assessment Tool was completed in Q4 of 2023 to include improvements and additional functionality recommended by an independent review team. The next iteration (3) will incorporate consultation and collaboration with key stakeholders via the Independent Technical Advisory Group (ITAG) prior to implementation.

Key components of Alcoa's water management and monitoring program include:

- Treatment of stormwater that may contain traces of hydrocarbons via a wastewater treatment system to concentrations that meet DWER license requirements prior to release.
- Turbidity monitoring along tributaries to key catchments to prevent contaminated or turbid runoff into the drinking water supply.
- Wastewater treatment and monitoring to meet DWER license requirements prior to release including treated water quality monitoring prior to release and continuous discharge volumes.
- Surface water drainage management to prevent uncontrolled surface water runoff from operations to the surrounding forest and/or surface water bodies.
- Implementation of the *Interim PFAS Water Management Strategy*. The interim Strategy will remain in place until the Contaminated Sites process outlined in section 17.1.2 is complete.
- Drainage protection management through the implementation of a Drainage Control Management Plan.

- Sewage management though a biological aeration treatment unit (BioMAX).
- Monitoring of cumulative water abstraction volumes at licensed and unlicensed surface water abstraction points in accordance with the *Surface Water License Operating Strategies* for Huntly and Samson Dam.
- Potable water monitoring for identification of possible biological or chemical contamination.
- Ecological water requirements (EWRs) have not been defined for the site, however Alcoa undertakes monitoring of the downstream environments to ensure no unacceptable impact. This is completed via photographic monitoring for Banksiadale Dam, Pig Swamp Waterhole, Boronia Dam and Marrinup Nursery. Note the EPA has not explicitly required Alcoa to develop EWRs as part of the formal impact assessment process for Myara North and Holyoake to date.
- Water use efficiency programs are implemented pertaining to wastewater recycling, efficient watering of haul roads, pumping and reusing water from roadside sumps, and effective mining planning to reduce dust suppression requirements.
- Alcoa, in association with the former Water and Rivers Commission, has researched the hydrology and salinity in the Jarrah forest since the 1970s, as part of the Joint Intermediate Rainfall Zone Research Program (JIRZRP). The JIRZRP has included monitoring of surface water, groundwater and salinity as well as analysis and modelling of the Intermediate Rainfall Zone (IRZ). This work continues to evaluate potential impacts of clearing and rehabilitation on groundwater salinization.
- Alcoa will continue to expand its monitoring program, as necessary, if groundwater quality or quantity has been identified as potentially at risk due to operational or mining activities, or potential exists for mining to impact offsite/private groundwater supply quantity or quality.

Baseline water quality monitoring has been undertaken at Myara North and Holyoake as part of the Part IV approvals process for these mining areas. It is anticipated that groundwater monitoring will be required as part of the operational license for these deposits.

17.3 Project Permitting

The environmental approvals and reviews / reporting form part of the BSEC/MMPLG approvals process outlined in Section 3.6. Compliance with the MMP will be demonstrated through an annual Compliance Assessment Report submitted to the Department of Jobs, Tourism, Science and Innovation.

From 14 December 2023, Alcoa is also required to comply with the requirements of the section 6 exemption. A section 6 exemption under the Environmental Protection Act 1986 (EP) allow continued operations whilst the Environmental Protection Authority undertakes an assessment of the mining activities which were not previously referred. Compliance against the section 6 exemption is monitored on a weekly basis by an independent compliance monitor and reported monthly to the Department of Water and Environmental Regulation.

Operational matters at the Willowdale and Huntly mines are licensed by the Department of Water and Environmental Regulation via instruments L6465/1989/10 and L6210/1991/10, respectively. These licenses condition the processing of ore and reporting is required annually to DWER describing the total volume of bauxite crushed and any non-compliance. The latest available reporting at the time of writing is for the calendar year 2023.

Compliance with the Alcoa ISO14001 accredited EMS was audited in December 2021, with recertification issued in May 2022. This recertification is valid until May 2025.

The only known requirement to post performance or reclamation bonds is a $100M AUD bank guarantee to help fund the Western Australian Government's response in the unlikely event of an impact to Perth's drinking water dams which is not rectified within the relevant time periods, announced as part of the Alcoa Transitional Approvals Framework (ATAF) on 14 December 2023. In September 2024 and October 2024, AofA delivered bank guarantees totalling $69M (A$100M) demonstrating confidence that operations will not impair drinking water supplies. The requirement to provide financial assurance will expire upon the completion of the WA EPA's assessment of the Company's mine plans.

17.4 Social or Community Requirements

Alcoa has established systems and processes to support maintenance of its social license to operate and conducts an extensive program of community relations activities to ensure that the public is aware and informed regarding its operations.

Alcoa strives to align its social performance and community engagement to global leading practice and was admitted to ICMM in 2019. In addition, Alcoa's Western Australian operations are certified under the Aluminum Stewardship Initiative, valid until 16 January 2026.

17.4.1 Community Consultation

Related to the requirements of the BSEC/MMPLG, Alcoa's actions include an annual 5-year consultation process aligned with the 5 Year Mine Plan. The consultation process involves engaging with affected landowners.

Alcoa's consultation extends to state and local government and Gnaala Karla Booja Aboriginal Corporation representing the Traditional Owners of the area.

Where appropriate, the mine plan accommodates community requirements, in particular, concerns related to noise, dust, etc., and allows for buffer zones and modified working hours.

Community consultation (both in-bound (e.g. noise complaints) and out-bound (e.g. Alcoa-initiated engagement with stakeholder groups)) is recorded in the Community Consultation System (CCS). CCS allocates and tracks follow-up actions.

Alcoa's move towards formal, publicly scrutinized environmental impact assessment and approval under the State and Federal acts (Section 3.6) for the extraction of future resources will provide greater transparency around Alcoa's future operations that should go some way to addressing the challenges it faces with some parts of the wider community.

Alcoa has formally consulted and engaged survey work from the relevant Traditional Owners across its operational footprint. Following a joint review of the Draft Cultural Heritage Management Plan late in 2024, Alcoa and Gnaala Karla Boodja have agreed that further work is required to finalise the document. In view of Gnaala Karla Boodja Aboriginal Corporation's capacity constraints, it is likely that finalization of the Cultural Heritage Management Plan will require a minimum of a further six months. A formal request for an extension of time to facilitate this has been submitted to the relevant Government regulator.

Alcoa seeks to add value to the communities where it operates and beyond. Through a drive for sustainable development and desire to support reputable non-profit and community-based organizations, community investment supports partnerships and initiatives that look to deliver long-term community benefits.

Each year Alcoa and its global charity, the Alcoa Foundation, invests in a wide variety of programs at the local, state, and national level. In 2023 Alcoa invested $5.2 million in community partnerships across the Australian regions where it operates its business.

In addition to community partnerships, employees are encouraged to participate each year in Alcoa Volunteers (volunteering as teams during work time) and employee giving programs. The Alcoa Community Together In Our Neighborhood (ACTION) program encourages employees to make a positive difference by volunteering in their communities with at least eight work-mates, Alcoa then matches these volunteering efforts with a $3,000 grant for nominated organizations.

17.4.2 Social Performance Management System

Alcoa's Social Performance Management System (SPMS), SP360, is in place across its global operations. The SPMS supports locations to undertake effective engagement with communities, manage their social risks, and maintain Alcoa's Social License to Operate.

SP360 includes the following management standards which guide social performance management:

- Social Performance Management Standard
- Human Rights Standard
- Indigenous and Land Connected Peoples Standard
- Cultural Heritage Management Standard.

Each location maintains a Social Performance Plan which details the activities Alcoa undertakes to support their understanding and management of social impacts and risks, including:

- Socio-economic baselines
- Social impact assessment and management plans
- Social risk assessments
- Stakeholder and community engagement planning
- Social commitments and obligation management
- Complaints and grievances handling.

17.5 Mine Closure Requirements

Alcoa's Closure Planning group for Darling Range (located within the Global Planning Team) is responsible for developing the closure planning process as well as the subsequent Long-Term Mine Closure Plans (LTMCPs) of Alcoa's WA Mining Operations (Huntly and Willowdale). Closure Strategies, Schedules and Cost Estimates are being developed across organizational divisions and includes multidisciplinary inputs from Operations, Mid- and Short-term Planning, Finance, Centre for Excellence, Environment and Asset Management (both Fixed and Mobile Plant).

As described in Section 15.5.2, overburden is used to backfill adjacent, completed mining operations and the topsoil spread on top and contoured.

Current rehabilitation practices and closure planning have evolved positively since the 1990s.

The agreed closure requirements for Darling Range centers around the return of Jarrah Forest across the site. End land uses are required to comply with the State's Forest Management Plan and include water catchment protection, timber production and biodiversity conservation. Completion Criteria were revised in 2015 by the MMPLG for rehabilitation works commencing in and after 2016. These criteria do not apply to areas which commenced rehabilitation prior to 2015 and represent a 'step forward' in rehabilitation practices at Darling Range.

The 2023-2027 MMP (and roll-over approval of 2024-28), and EIA process being applied to Myara North and Holyoake represent another step forward in rehabilitation planning. Appropriate mine planning and closure implementation mitigates environmental risks to ecological, hydrological, social and physical receptors. In addition, the current Completion Criteria will be revised in consultation with DBCA by 31 December 2024.

The 2023-2027 MMP (and roll-over approval of 2024-28) aims to establish, and return to the State, a self-sustaining Jarrah Forest ecosystem, that meets the agreed forest values that will support similar management practices as that employed in the surrounding Northern Jarrah Forest.

Mine closure costs are considered as part of Asset Retirement Obligations (ARO) described in Section 18.0.

17.6 Local Procurement and Hiring

Alcoa's Local Community Supplier Policy defines "local" as the localities of Dwellingup, Harvey, Pinjarra, Waroona, Coolup, North Dandalup, Jarrahdale and Yarloop. Within Alcoa's guidelines of safe, ethical, and competitive business practices, Alcoa's Local Community Supplier Policy states it will:

- Invite capable local business to bid on locally supplied or manufactured goods or services.
- Give preference to local business in a competitive situation.
- Work with local business interest groups to identify and utilize local suppliers.
- Where possible, structure bids to enable local supplier participation.

Whilst the Policy does not specifically address local hiring, most of the mine's workforce are based within the close vicinity.

Alcoa also endeavors to add value to Traditional Owners and the local economy through the use of businesses owned by Traditional Owners, businesses that employ and work with Traditional Owners and locally owned businesses. Alcoa will help Traditional Owner businesses and local businesses to do business with Alcoa and encourage the employment of Traditional Owner and local labor. Alcoa have made a policy commitment to:

- Invite capable local Traditional Owner, Aboriginal and Torres Strait Islander and Local businesses to bid on every locally supplied or manufactured good or service.
- Give preference to Traditional Owner, Aboriginal and Torres Strait Islander and Local businesses in a competitive situation.
- Tender evaluations shall apply a minimum weighting of 10 per cent for Traditional Owner, Aboriginal and Torres Strait Islander and Local businesses.
- Work with Traditional Owner, Aboriginal and Torres Strait Islander and Local business interest groups to identify, utilize and build local supplier capability.
- Offer reduced Payment Terms to support the growth and sustainability of Traditional Owner, Aboriginal and Torres Strait Islander and Local business.

18.0 Capital and Operating Costs

Alcoa forecasts its capital and operating costs estimates based on annual budgets and historical actuals over the long life of the current operation. All values are presented in United States Dollars ($) unless otherwise stated.

18.1 Capital Costs

The operation is well-established, and the LOM plan outlines capital expenditures aligned with scheduled production rates throughout the mine's life. This includes future capital expenditures for major mine relocations to meet anticipated refinery production while sustaining ongoing operations.

Projected mine capital expenditure over the next nine years of mine life is estimated to total $1,175 million, although this will include capital outlay required to extend the mine life much beyond the nine-year period covered by the valuation. Of this total, it is understood that $183 million is associated with completing the mine move to the Myara North site. Capital for the Holyoake move is estimated to be $471 million.

A breakdown of the major expenditure areas and other sustaining capital expenditure over the next nine years of mine life (2025 – 2033) is shown below.

Table 18-1: Nine Year LOM Sustaining Capital Costs by Area

Project	Cost $ Million	Percentage of Total
Mine Moves	787	67.0%
Conveyor Belt Replacements	53	4.5%
Haul Road Improvements	136	11.6%
Other Sustaining capital	199	16.9%
Total	**1,175**	**100%**

Other capital costs are for replacement of conveyors, haul road improvements and other sustaining capital needed to continue the operations.

Alcoa's sustaining capital estimates for Darling Range are derived from annual budgets and historical actuals over the long life of the current operation, as well as detailed feasibility studies where required (such as for the mine moves) that include costs and associated contingencies. These are noted to be less than 10% of the total capital costs. According to the American Association of Cost Engineers (AACE) International, these estimates would generally be classified as Class 1 or Class 2 with an expected accuracy range of -3% to -10% to +3% to +15%. The SLR QP is satisfied that the costs meet these accuracy requirements.

18.2 Operating Costs

The main production mining operations are primarily Owner-operated using Alcoa equipment and employees, with contractors engaged for specific supporting activities.

Operating costs are derived from historical site cost data and, in the QPs opinion, achieve an accuracy range of -10% to +15%, which is appropriate for this level of study.

No material factors have been identified that would significantly impact operating costs over the life of mine. Year-to-year variations are expected due to routine maintenance outages and production schedule fluctuations. Table 18-2 presents both the forecast costs for 2025 and average operating costs over the nine-year LOM. As intended, the Kwinana refinery

ceased production in the second quarter of 2024 following phased curtailment. The updated mine plans and operational cost projections have been revised accordingly.

Table 18-2: LOM Mine Operating Costs by Category*

Cost Centre	2025 ($/wmt)	Average LOM ($/wmt)	Percentage of Operating Cost
Direct Labor	$3.70	$4.13	32%
Services	$1.83	$1.16	9%
Other	$1.48	$3.01	24%
Corporate Chargebacks for support services	$1.08	$0.80	6%
Energy	$0.23	$0.10	1%
Fuel	$0.67	$0.77	6%
Operating Supplies and Spare Parts	$0.79	$0.92	7%
Maintenance (fixed plant and mobile fleet)	$1.17	$1.91	15%
Mine Operating Cash Cost ($/wmt)	**$10.95**	**$12.80**	**100%**
Off-site Costs			
G & A, selling and other expenses	$0.85	$0.57	
R & D Corporate Chargebacks	$0.13	$0.06	
Other COGS	$0.15	$0.12	
Total Cash Operating Costs	**$12.08**	**$13.55**	

** Due to rounding, numbers presented may not add up precisely to the totals provided*

Services costs include contractor costs for certain mining activities such as in noise sensitive areas and for haul road construction services, in select areas of pit development, and during landscaping activities for rehabilitation after mining.

As of December 2024, the Huntly and Willowdale operations together employ 981 employees consisting of 36 technical, 122 management and 823 operations employees. Additionally, 171 employees are centrally employed on the combined operations.

Table 18-3 summarizes the current workforce for the operations.

Table 18-3: Workforce Summary

Category	Technical	Management	Operations	Total
Huntly	24	71	566	**661**
Willowdale	12	51	257	**320**
Central	46	21	104	**171**
Total	**82**	**143**	**927**	**1152**

As regards mine closure, compensation for vegetation clearing is paid in advance and rehabilitation is an ongoing process that is incorporated into the mining cost (as part of Asset Retirement Obligations (ARO)).

19.0 Economic Analysis

19.1 Economic Criteria

Alcoa prepares a rolling operational LTMP for the purposes of long-term mine and business planning.

The assumptions used in the analysis are current as of 31 December 2024.

A technical-economic model was prepared on an after-tax discounted cash flow (DCF) basis, the results of which are presented in this subsection.

The cashflow is presented on a 100% attributable basis. Alcoa has applied a 9.5% discount rate for DCF analysis. The QP is of the opinion that a 9.5% discount/hurdle rate for after-tax cash flow discounting of such large-scale bauxite mining projects in Western Australia with a demonstrable operating track record is reasonable and appropriate, considering both project-specific factors and sovereign risk profile.

Key criteria used in the analysis are discussed elsewhere throughout this TRS. General assumptions used are summarized in Table 19-1. All values are presented in United States Dollars ($) unless otherwise stated.

Table 19-1: Technical-Economic Assumptions

Description	Value
Start Date	January 1, 2025
Mine Life based on Mineral Reserves	9 years
Average LOM Price Assumption	$23.19
Total Operating Costs	$4,045.2 million
Capital over nine years	$1,174.6 million
Income tax	$226.0 million
Discount Rate	9.5%
Discounting Basis	End of Period
Corporate Income Tax Rate	30%
Model Basis	Nominal

Table 19-2 provides a summary of the estimated mine production over the nine-year model life.

Table 19-2: LOM Production Summary

Description	Units	Value
Total ROM Ore	Mt	326.0
Waste Mined	Mt	65.6
Total Material Moved	Mt	393.4
Annual Average Ore Mining Rate	Mtpa	33.2

19.2 Cash Flow Analysis

The economic analysis presented herein complies with S-K 1300 requirements and is based on a reserve-based analysis using only Proven and Probable Mineral Reserves for the current 9-year mine planning window.

19.2.1 Economic Analysis

The economic analysis, consistent with previous submissions, considers only the Proven and Probable Mineral Reserves, supporting a nine-year mine life (2025-2033) with production averaging 33.2 Mtpa (wet tonnes). Production volumes are determined by refinery requirements rather than mining constraints, with annual throughput varying from 27.4 Mtpa (2025) to 37.2 Mtpa (2029). The QP confirms that sufficient Proven and Probable Reserves exist to support this production profile.

Using the defined 9-year detailed mine plan period, at a 9.5% discount rate and average bauxite price of $23.19/t, the operation generates an after-tax NPV of $54.7 million. The bauxite price used in the cashflow is defined by an intercompany price inflated by 3% YoY, equivalent to the $23.19/t average over the detailed mine plan period of nine years.

This figure reflects substantial sustaining capital requirements during the period. This valuation is presented on a 100% attributable basis using nominal cash flows which allow for annual price inflation of 3% and cost escalation ranging primarily between 2 and 3%.

The QP notes several factors supporting potential operation beyond 2033, including demonstrated success in annual Resource to Reserve conversion through infill drilling, extensive operational history, scale of existing deposits, and consistent historical Reserve replacement rate.

19.2.2 Analysis Summary

Table 19-3 summarizes the key project economic results and estimated cash flows provided for the period 2025 to 2033. The economic analysis, conducted using the technical inputs and cost estimates presented in this Technical Report Summary, confirms positive cash flows that supports the statement of Mineral Reserves.

Table 19-3: LOM Indicative Economic Results

	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33
Macro Assumptions									
Region	Australia	Australia	Australia	Australia	Australia	Australia	Australia	Australia	Australia
Days/Year	365	365	365	365	365	365	365	366	365
IntraCo Price	$ 20.16	$ 20.57	$ 20.98	$ 21.40	$ 21.83	$ 22.26	$ 22.71	$ 23.16	$ 23.62
3P Price	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
Local Currency	USD/AUD	USD/AUD	USD/AUD	USD/AUD	USD/AUD	USD/AUD	USD/AUD	USD/AUD	USD/AUD
Fx Rate	0	0	0	0	0	0	0	0	0
Minority Interest	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tax Rate	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
Production									
IntraCo Production (Wet Kt)	$ 27,418,872	$ 27,268,000	$ 29,658,177	$ 30,115,920	$ 37,214,000	$ 36,955,000	$ 36,809,000	$ 37,131,000	$ 36,868,000
3P Production (Wet Kt)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Production (Wet Kt)	$ 27,418,872	$ 27,268,000	$ 29,658,177	$ 30,115,920	$ 37,214,000	$ 36,955,000	$ 36,809,000	$ 37,131,000	$ 36,868,000
Shipments									
IntraCo Shipments (Wet Kt)	$ 27,418,872	$ 27,268,000	$ 29,658,177	$ 30,115,920	$ 37,214,000	$ 36,955,000	$ 36,809,000	$ 37,131,000	$ 36,868,000
3P Shipments (Wet Kt)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Shipments (Wet Kt)	$ 27,418,872	$ 27,268,000	$ 29,658,177	$ 30,115,920	$ 37,214,000	$ 36,955,000	$ 36,809,000	$ 37,131,000	$ 36,868,000
--Income Statement--									
Sales	559,261,386	572,268,841	616,001,527	670,937,297	862,796,467	872,268,123	894,814,769	929,797,529	951,881,984
Cost of goods sold	304,027,045	374,061,706	384,305,823	436,291,267	565,980,099	577,590,062	415,893,394	385,398,609	391,783,172
Selling, general administrative, and other expenses	23,441,816	18,548,716	18,423,804	18,318,527	18,230,111	18,142,122	18,054,557	17,967,416	18,326,764
Research and development expenses	3,641,403	1,671,011	1,658,412	1,647,793	1,638,674	1,629,996	1,621,756	1,613,955	1,646,623
Provision for depreciation, depletion, and amortization	91,012,747	164,171,030	211,844,402	256,657,328	223,456,270	194,788,163	230,160,016	192,016,082	195,856,403
Restructuring and other charges	-	-	-	-	-	-	-	-	-
Other expenses (income), net	-	-	-	-	-	-	-	-	-
Total costs and expenses	**422,123,011**	**558,672,457**	**616,432,441**	**715,114,913**	**829,487,354**	**792,351,365**	**668,829,133**	**597,194,463**	**607,614,962**
Income (loss) before income taxes	130,138,375	13,596,384	2,169,086	(45,077,616)	23,311,134	79,917,758	225,985,627	332,603,066	343,866,902
Provision for income taxes	40,941,513	4,078,915	650,726	(13,523,285)	6,993,340	23,975,327	67,795,688	99,780,920	103,160,071
Net income (loss)	**95,256,863**	**9,517,469**	**1,518,360**	**(31,554,331)**	**16,317,793**	**55,942,430**	**158,119,939**	**232,822,132**	**240,706,832**
Less: Net income attributable to noncontrolling interest	-	-	-	-	-	-	-	-	-
Net Income (Loss) Attributable to Alcoa Corporation	95,256,863	9,517,469	1,518,360	(31,554,331)	16,317,793	55,942,430	158,119,939	232,822,132	240,706,832
EBITDA	227,151,122	177,767,414	214,013,488	211,579,710	246,768,404	274,706,921	459,045,643	524,619,129	539,723,305
EBIT	136,138,375	13,596,384	2,169,086	(45,077,616)	23,311,134	79,917,758	225,985,627	332,603,046	343,866,902
--Cash Flow Statement--									
CF Income before NCI	95,256,863	9,517,469	1,518,360	(31,554,331)	16,317,793	55,942,430	158,119,939	232,822,132	240,706,832
CF Depreciation, depletion, and amortization	91,012,747	164,171,030	211,844,402	256,657,328	223,456,270	194,788,163	230,160,016	192,016,082	195,856,403
CF Working capital change	10,840,111	11,434,747	1,989,468	(1,120,154)	8,562,829	(1,416,841)	(7,000,105)	(1,731,957)	977,809
CF Equity earnings net of dividends	-	-	-	-	-	-	-	-	-
CF Pension contributions net of accrual	-	-	-	-	-	-	-	-	-
CF Tax payments net of accrual	-	-	-	-	-	-	-	-	-
CF Other (Cash from Operations)	(134,503,759)	(129,445,177)	(128,579,936)	(110,310,104)	(110,751,702)	(111,743,202)	(109,179,128)	(109,737,259)	(111,932,003)
Cash from Operations	**62,605,961**	**64,678,069**	**86,652,314**	**113,672,737**	**137,586,991**	**137,571,550**	**275,100,722**	**313,368,959**	**325,609,040**
CF Distributions to NCIs	-	-	-	-	-	-	-	-	-
CF Contributions from NCIs	-	-	-	-	-	-	-	-	-
CF Change in debt	-	-	-	-	-	-	-	-	-
CF Stock issuances / repurchases	-	-	-	-	-	-	-	-	-
CF Other (Cash from Financing)	-	-	-	-	-	-	-	-	-
Cash from Financing	-	-	-	-	-	-	-	-	-
CF Capital expenditures	(113,265,408)	(195,837,871)	(151,995,788)	(170,488,025)	(200,351,783)	(213,736,479)	(40,842,436)	(44,274,351)	(44,080,857)
CF Acquisitions/divestitures	-	-	-	-	-	-	-	-	-
CF Investments	-	-	-	-	-	-	-	-	-
CF Other (Cash from Investing)	-	-	-	-	-	-	-	-	-
Cash from Investing	(113,265,408)	(195,837,871)	(151,995,788)	(170,488,025)	(200,351,783)	(213,736,479)	(40,842,436)	(44,274,351)	(44,080,857)
Free Cash Flow	**$ (50,659,445)**	**$ (130,959,802)**	**$ (65,343,475)**	**$ (56,733,289)**	**$ (62,764,792)**	**$ (76,164,928)**	**$ 234,258,286**	**$ 269,094,607**	**$ 281,528,183**
Model NPV **$ 54,714,260**	$ (50,659,445)	$ (119,087,993)	$ (34,497,175)	$ (43,211,128)	$ (43,657,576)	$ (48,352,099)	$ 139,697,118	$ 142,952,781	$ 135,219,752

19.3 Sensitivity Analysis

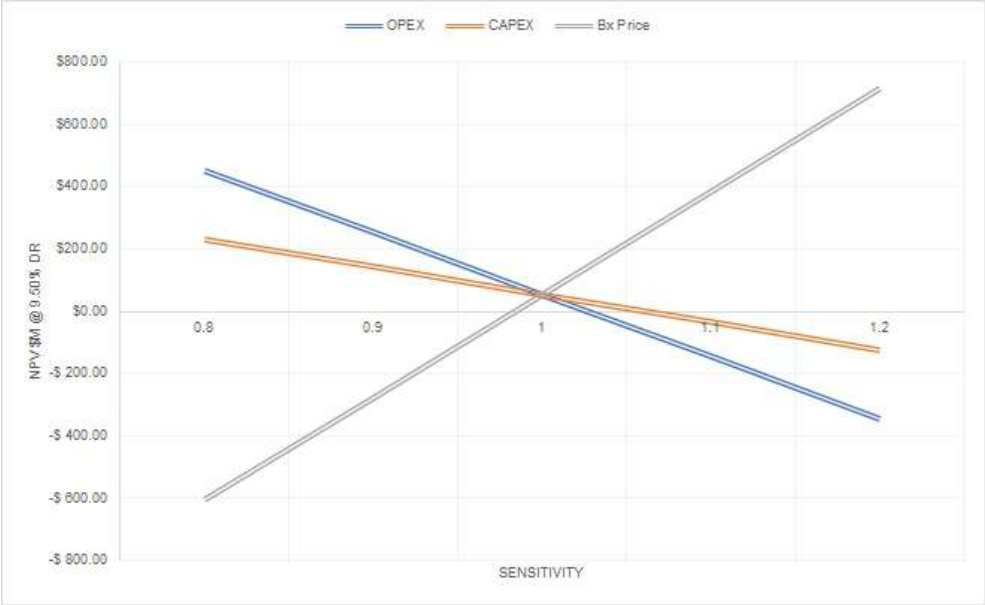
Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities. The operation is nominally most sensitive to market prices (revenues) followed by operating costs.

Figure 19-1: Sensitivity Analysis (NPV)

NPV $M OPEX	80%	90%	100%	110%	120%
7.50%	$523.42	$310.29	$97.15	-$ 115.99	-$ 329.13
8.50%	$486.97	$280.99	$75.01	-$ 130.96	-$ 336.94
9.50%	$453.14	$253.93	**$54.71**	-$ 144.50	-$ 343.71
10.50%	$421.74	$228.91	$36.09	-$ 156.73	-$ 349.55
11.50%	$392.56	$205.78	$19.00	-$ 167.78	-$ 354.56

NPV $M CAPEX	80%	90%	100%	110%	120%
7.50%	$285.29	$191.22	$97.15	$3.08	-$ 90.99
8.50%	$258.17	$166.59	$75.01	-$ 16.57	-$ 108.15
9.50%	$233.13	$143.92	**$54.71**	-$ 34.49	-$ 123.70
10.50%	$209.99	$123.04	$36.09	-$ 50.86	-$ 137.81
11.50%	$188.59	$103.80	$19.00	-$ 65.79	-$ 150.58

NPV $M Bx Price	80%	90%	100%	110%	120%
7.50%	($614.79)	-$ 258.82	$97.15	$453.12	$809.09
8.50%	($611.05)	-$ 268.02	$75.01	$418.05	$761.08
9.50%	($607.00)	-$ 276.14	**$54.71**	$385.57	$716.43
10.50%	($602.70)	-$ 283.30	$36.09	$355.48	$674.88
11.50%	($598.17)	-$ 289.58	$19.00	$327.59	$636.18



20.0 Adjacent Properties

The Darling Range has no material adjacent properties.

21.0 Other Relevant Data and Information

No additional information or explanation is necessary to make this Technical Report Summary understandable and not misleading.

22.0 Interpretation and Conclusions

22.1 Geology and Mineral Resources

- SLR is independently declaring the 31 December 2024 Mineral Resources for the defined bauxites located within Alcoa's Darling Range deposits. The Mineral Resource models were prepared by Alcoa using their in-house estimation procedures and reviewed extensively by SLR.
- As of December 31, 2024, exclusive of Mineral Reserves, as summarized in Table 11-13 at an appropriate level of precision reflecting confidence, the Measured Mineral Resources are estimated to be 139.6 Mt at a grade of 30.4% available alumina (AL) and 1.77% reactive silica (SI). Similarly, the Indicated Mineral Resources are estimated to be 48.7 Mt at 30.3% AL and 1.42% SI, and the Inferred Mineral Resources are estimated to be 101.4 Mt at 32.4% AL and 1.20% SI.
- Drill sampling and sample control procedures at Alcoa's Darling Range Bauxite Operations are adequate and appropriate for use in the estimation of Mineral Resources. The defined volumes and grades of mineralization are not expected to be systematically impacted (biased) by errors in either the collar location or the 3D sample location.
- The Quality Assurance / Quality Control (QA/QC) of sample preparation and assaying is adequate, and the assay results are suitable for use in Mineral Resource estimation
- Analytical procedures used for the Alcoa Mineral Resource comprises part of conventional industry practice. FTIR is not widely used yet in the bauxite industry but is becoming more widely accepted and applied to more operations. At Alcoa the method has been consistently applied successfully for a decade and is routinely validated by industry standard XRF and wet chemical procedures as discussed in Sections 8.3 and 8.4. It is the opinion of the QP from the studies on FTIR repeatability discussed above that the overall precision and accuracy of the FTIR assaying is acceptable.
- The database is adequate, and the data is appropriate for the purpose of Mineral Resource estimation.
- The continuous improvements in the geological modelling, estimation techniques, and block model migration to the 3D approach are appropriate and constantly improve the confidence level and precision of the Mineral Resources.
- The dry bulk density data is less well controlled than other analytes, although different attempts were taken since 1980. However, based on the different reconciliation approaches and on the fact that the polygonal and GSM model have lower confidence level, the density values are acceptable for the Resource estimation.
- The condition of Reasonable Prospects for Economic Extraction is met by constraining the Mineral Resource model using the ArcGIS system, by ensuring that the model defines key parameters for the refinery, and by sound reconciliation practices providing feedback that the modelling is appropriate for the purpose.

22.2 Mining and Mineral Reserves

- As of December 31, 2024, Proven Mineral Reserves are estimated to total 26.1 Mt at 29.2% AL and 1.61% SI and Probable Mineral Reserves are estimated to total 397.6 Mt at 30.8% AL and 1.56% SI.

- The QP has used the December 31, 2024 Mineral Resource estimate as the basis for its Mineral Reserve estimate, applying Modifying Factors only to those Resources classified as Measured Mineral Resources and Indicated Mineral Resources.
- The bauxite operations are operating mining projects with a long history of production for which establishment capital has been repaid and for which sustaining capital and supported operating costs have been observed to be applied in economic analysis. The review of the Capex Front End Loading (FEL) 2 Study report for the Myara North Crusher move has provided further support. Consequently, the QP considers that support by a Feasibility Study (FS) is demonstrated by the history of profitable operation and the level of technical support for the Modifying Factors. The QP has reviewed the operating and planning procedures and parameters for the operations.
- The QP considers that the accuracy and confidence in the Mineral Reserve estimate to be appropriate for the classification applied, which is supported by both the conservative operational processes and the long operational history.
- The QP is not aware of any risk factors associated with, or changes to, any aspects of the Modifying Factors such as mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the current Mineral Reserve estimate. The Darling Range operations have however undergone some changes as related to the permitting requirements which are discussed in this report; namely the approvals process, river corridor constraints, restoration obligations, and any required adjustments to accommodate the Q2 2024 curtailment of the Kwinana refinery.

22.3 Mineral Processing

- The operating data between 2010 and 2024 indicates that the product from the Darling Range operations consisted of an average AL grade of 33%, with SI below the target for refinery feed.
- The QP is of the opinion that the Darling Range operation demonstrated that ore can be effectively crushed and supplied to a refinery for further upgrading to produce alumina. The historical operational data confirmed that the ore consistently met refinery specifications without any deleterious elements.
    - Based on this, and additional information provided by Alcoa regarding the mine plan, it is reasonable to assume that the ore from Darling Range will meet the refinery specifications for the next nine years.

22.4 Infrastructure

- The Darling Range mining operations have established and operational infrastructure, with mining hubs that host administrative offices, as well as crushing facilities and maintenance facilities.
    - Hubs are relocated periodically as production moves away from the hub and transportation costs increase. These relocations are well-understood with planning and associated budgeting occurring well in advance of relocations; production restarted seven days after the most recent shutdown.
- An extensive haul road network, rail, and overland conveyors transport crushed bauxite from the Hub to the refineries.
    - Bauxite is transferred from each mine to the refineries primarily via long distance conveyor belt.
    - Alumina produced by the Pinjarra and Wagerup refineries is then shipped to external and internal smelter customers through the Kwinana and Bunbury ports.

- As intended the Kwinana refinery ceased production in the second quarter of 2024 following phased curtailment. The updated mine plans have been revised accordingly.

- The Huntly and Willowdale mines are located near the towns of Pinjarra and Waroona respectively. These are easily accessible via the national South Western Highway, a sealed single carriageway road, spanning almost 400 km from the southern side of Perth to the southwest corner of Western Australia.
- Sealed access roads to the main hubs have been established, connecting Huntly and Willowdale to the road network.
- Major haul roads have been established to each mining area, while secondary haul roads cross-cut each individual mining plateau. Roads are unsealed and require continuous maintenance.
- The Darling Range's Pinjarra refinery receives power from the South West Interconnected System (SWIS), but also has internal generation capacity of 100 MW from four steam driven turbine alternators, with steam produced by gas fired boilers and a gas turbine Heat Recovery Steam Generator (HRSG).
  - The refinery supplies power to the Huntly Mine by a 33,000 volt power supply line and two 13,800 volt lines.
- The Wagerup refinery is a net exporter of power to the SWIS, with internal generation capacity of 108 MW from three steam driven turbine alternators and one gas turbine; steam being generated by gas fired boilers.
  - The refinery supplies power to the Willowdale Mine by a single 22,000 volt power supply.
- Water is used on the mines for dust suppression, dieback washdown, vehicle washdown, workshops, conveyor belt wash, construction, and domestic purposes.
  - The water supplies for mining consist of licensed surface water sources supplemented with treated wastewater from vehicle washdowns, stormwater runoff and maintenance workshops.
  - The annual volume of freshwater abstracted under the Department of Water and Environmental Regulation (DWER) surface water licences and Water Corporation supply agreements decreased from Boronia Dam in comparison to 2022, and remained reasonably consistent to 2022 from Banksiadale and Samson Dams.
  - In 2023, water abstraction comprised approximately:
    - 4.2% of the annual entitlement from Boronia Dam (i.e. 2,931.1 kL), in comparison to 53% in 2022.
    - 22% from Banksiadale Dam (i.e. 108,412 kL), in comparison to 22% in 2022.
    - 82% from Samson Dam (i.e. 368,017), in comparison to 70% in 2022.
  - An additional 126,306 kL was also abstracted from South Dandalup Dam under the agreement with Water Corporation, significantly reduced from 2022 (651,840.7 kL).
- On site facilities include offices, ablutions, crib-rooms, and workshops, however there are no Alcoa accommodation facilities, as the Huntly and Willowdale mining areas are close to established population centers.
- No tailings are generated within the boundaries of the mining operations and waste dumps are not constructed. The management of tailings generated downstream at

the refineries is beyond the boundaries of the Darling Range mining operations and are therefore not considered in this TRS.

- Overburden is segregated for later contouring and rehabilitation of adjacent, completed mining operations. Caprock and other non-viable rock is used to backfill these shallow, completed pits and the viable topsoil is spread on top, contoured, and revegetated.

22.5 Environment

- Alcoa has established processes to facilitate conformance with environmental requirements, identifying sensitive areas ahead of time enables them to be managed ahead of disturbance.
- Mining in some areas became more constrained in 2023 as a result of internal and external factors. This has continued into 2024 and has resulted in a presumed temporary decrease in operability and associated decrease in Reserve estimation.
- The 2023-2027 MMP describes Alcoa's proposed mining operations for the Huntly and Willowdale mines within ML1SA from 1 January 2023 to 31 December 2027. It excludes an environmental assessment of mine development activities associated with Myara North or Holyoake mining regions currently under consideration by the EPA and DCCEEW.
- Alcoa has made progress in drafting and implementing a number of new management plans and processes required to meet current compliance requirements.
- Alcoa is modernizing its environmental approvals framework for its Huntly Bauxite Mine and Pinjarra Alumina Refinery, by referring future mining plans for assessment under Part IV of the Western Australian *Environmental Protection Act 1986* (EP) and the Australian *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Construction for Myara North will be commenced pursuant to the requirements of the Ministerial Decision, which will be issued upon completion of the EPA assessment process indicatively forecast for the first quarter of 2026, as opposed to approximately mid-2025 as reported in the TRS for 2023. The timeframe to approval of Myara North and Holyoake under the EP and EPBC Act can be estimated, but not predicted with certainty; further delays are possible.
- Importantly, on 14 December 2023 the State Government announced the *Alcoa Transitional Approvals Framework* which will enable Alcoa to continue mining as defined in the 2023-2027 MMP while the formal EPA EIA is in progress. In most circumstances, activities under assessment must cease during the EPA's process. Note, that the State Government reserves the right to, with reasonable notice, withdraw or amend the exemption at any point. In October 2024 the Premier rolled over the 2023-2027 approval to cover 2024-2028 with the same conditions.
- Alcoa's mine sites are monitored in accordance with the conditions of Government authorizations and its operational licenses at Huntly (L6210/1991/10) and Willowdale (L6465/1989/10) and the MMP. Compliance with the section 6 exemption order is also required from 14 December 2023. Outcomes of and compliance with the management and monitoring programs are tracked within Alcoa's Environmental Management System and reported within the Annual Environmental Review report:
    - Review of the most recent report, JTSI Annual Environmental Review 2023 (dated April 2024), largely reported compliance with environmental commitments and success of operational controls to manage environmental objectives.

  - In addition, outcomes of and compliance with the management and monitoring programs are reported within the 2023 Annual Environmental Review against the current MMP to JTSI, and in monthly reports demonstrating compliance with the Exemption Order.
- Alcoa implements a comprehensive water management and monitoring program in accordance with the requirements of its abstraction and operational licenses.
- A groundwater monitoring program commenced in the second half of 2022 across the Darling Range operations to support approvals and operational monitoring, this is ongoing.
- Alcoa has established systems and processes to support maintenance of its social license to operate and conducts an extensive program of community relations activities to ensure that the public is aware and informed regarding its operations.
- Alcoa's Social Performance Management System (SPMS), SP360, is in place across its global operations. The SPMS supports locations to undertake effective engagement with communities, manage their social risks and maintain Alcoa's Social License to Operate.
- Alcoa's Closure Planning group for Darling Range (located within the Global Planning Team) is responsible for developing the closure planning process as well as the subsequent Long-Term Mine Closure Plans (LTMCPs) of Alcoa's WA Mining Operations (Huntly and Willowdale).
- The current 2023-2027 MMP aims to establish, and return to the State, a self-sustaining Jarrah Forest ecosystem, that meets the agreed forest values that will support similar management practices as that employed in the surrounding Northern Jarrah Forest.

23.0 Recommendations

23.1 Geology and Mineral Resources

It is apparent to the QP that the long history of exploration, development and mining of Alcoa's Darling Range bauxite tenements have established sound knowledge and understanding of the geology and mineral endowment. The QP has not identified any fatal flaws in the current practices of mapping (based on the ArcGIS system), drill sampling (based on progressive continuous improvement), assaying (based on calibrated and validated FTIR, with reasonable quality control), estimation (3D Block Model - 3DBM), database management (using acQuire), the application of mining criteria that assure RPEE, and the application of constraints establishing forestry, heritage and noise limits to the Mineral Resource definition. The following recommendations are offered as suggestions for further improvement, aligned with Alcoa's comprehensive approach to research and development (seen for example in the evolution of their drilling, sampling and assaying technologies). These recommendations are prioritized in terms of their perceived value to the overall operation, but are not expected to add cost:

- Continuing to replace the gridded seam model (GSM) and polygonal areas to the 3D block modelling methodology, using a script-based semi-automated approach, which enables more robust rapid model building. The validation of interpolation parameters using risk-based (conditional simulation) techniques to quantify confidence should be considered.
- To improve the reporting of recoverable resources, a re-blocked block model to a minimum practical mining scale or single mining unit (SMU) should be considered. Economical parameters considering more flexible costs and bauxite prices related to the Mineral Reserves can also be implemented in the Mineral Resources workflow, aiming to optimize the bauxite mineable portion including potential marginal grades.
- Investigate whether the 5% bias in the tonnage between the As Mined and sampling tower weightometers is persistent in the 3D block models.
- Further redrilling or where viable re-assaying of pulps.
- Continue implementing the reconciliation system to understand and adjust differences in density and reactive silica, as well as to track the monthly performance of geological models with the refinery.
- To include volume surveys using drones and truck gantry scanning, wet mass measurement using weightometers on conveyors and LoadRite sensors on mining equipment, and infra-red moisture determination, meaning that better in situ dry density estimation may become possible if the operation requires it for better refinery feedstock control.
- The QP considers that twinned hole studies are of limited value and should only be implemented once the sample splitting and preparation demonstrates good repeatability, using field duplicates (or the equivalent sample to extinction (STE) samples). They may be of value to investigate specific issues under closely supervised conditions.
- While the STE procedure could be retained for specific studies, in the QP's opinion, the reintroduction of field duplicates using appropriate riffle splitters under supervision should be considered.
- The QP is of the opinion that the grade characteristics of the bauxite profile could be reproduced in the model, which enables optimization techniques to be used for the definition of mining floors and boundaries, better support for ore loss and dilution studies, and more accurate reconciliation studies.

23.2 Mining and Mineral Reserves

- Currently a historical dilution and mining recovery factor is applied to the final Reserves to reconcile the tonnes and grade. The QP recommends applying dilution and ore loss at the re-blocked model level before performing the optimization and reporting these values independently.
- A reconciliation system should be implemented to allow the comparison of mined tonnes to the predicted tonnes of the geological model. This system would assist in defining dilution and losses related to modifying factors. Alcoa has been actively developing this reconciliation system during 2024 with an intention to implementation for 2025.
- As recommended from 2023, a mine planning schedule (LTMP) has been developed providing a strategic schedule over nine years which incorporates a tactical schedule over the first 3 years. However, currently Reserves would provide an additional 3 years of mine scheduling which would benefit cashflow modelling. Completing a strategic mine schedule for the total Reserve would allow impacts from sequencing of later Capital costs to be modelled appropriately. The view of the QP is that the unscheduled Reserve ore tonnes should be added to the LTMP.
- The QP recommends that a defined Process Acceptance Criteria is provided with specifications on upper and lower limits for all key process constraints.
- The QP recommends detailed haulage analysis is provided focusing on haulage profiles and cycle times, this process will provide more accurate forecasting of operating costs. It is noted during the 2024 visit that Alcoa are currently developing workflows for simulation software.
- Capital costs for the Myara North and Holyoake mine moves were in the process of being developed to FEL 3 classification. These costs should be reviewed during the next update.

23.3 Mineral Processing

The historical operational data for the Darling Range demonstrates that ore consistently met refinery specifications.

- Ideally, independent verification of sample analysis is conducted, by a certified laboratory, on a structured program, to ensure the QA/QC aspects of the internal analysis. Within this process a proportion of samples from each batch could be sent to the independent laboratory for analysis and the results can be compared with the internal analysis.
- The QP is appreciative that the mine is operational, meaning a trade-off versus logistics / practicality would need to be carried out.

23.4 Infrastructure

The Darling Range mining operations have well established infrastructure, with mining hubs that are periodically moved to reduce transportation distances between mining operations and the hubs. The QP makes no recommendations regarding infrastructure.

23.5 Environment

Alcoa has established systems to facilitate adherence to environmental commitments and has made progress with modernizing environmental approvals and permits for Huntly, Willowdale and the future mining areas at Holyoake and Myara North. The QP recommends that the following action is taken:

- Continued close engagement with EPA, DCCEEW and BSEC (previously MMPLG) to best enable a prompt resolution to approval and permitting process to minimize impacts to the Reserve estimate into the future.
- Continued compliance with all approval and permit requirements. Compliance with the conditions associated with the *Alcoa Transitional Approvals Framework* exemption is critical as the State Government reserves the right to, with reasonable notice, withdraw or amend the exemption at any point.
- Alcoa began installing groundwater monitoring bores in 2022 to facilitate assessment of groundwater levels and water quality in proposed mining areas. The boreholes are installed prior to mining to understand the baseline site conditions and interim groundwater levels and inform pit design and to understand the recharge from precipitation in the long term and to assess the groundwater response before, after and during mining operations. Preliminary results and how those results have informed changes to pit design should be reported in the next TRS.
- Close-out the Auditor-compliant contaminated sites process related to the identification of low levels of PFAS and AFFF on site.

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25.0 Reliance on Information Provided by the Registrant

This report has been prepared by SLR for Alcoa. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to SLR at the time of preparation of this report,
- Assumptions, conditions, and qualifications as set forth in this report, and
- Data, reports, and other information supplied by Alcoa and other third party sources.

For the purpose of this report (namely Section 1.3.3), SLR has relied on ownership information provided by Alcoa in a legal opinion by Paul Volich, Managing Counsel – Australia, dated 22 January 2025, entitled Technical Report Summary on the Darling Range, Western Australia S-K 1300 Report for Alcoa Corporation – that ML1SA in good standing. SLR has not researched property title or mineral rights for the Darling Range as we consider it reasonable to rely on Alcoa's legal counsel who is responsible for maintaining this information.

SLR has relied on Alcoa for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from Darling Range in the Executive Summary and Sections 18.0 and 19.0. As Darling Range has been in operation for over ten years, Alcoa has considerable experience in this area.

The Qualified Persons have taken all appropriate steps, in their professional opinion, to ensure that the above information from Alcoa is sound.

Except for the purposes legislated under applicable securities laws, any use of this report by any third party is at that party's sole risk.

26.0 Date and Signature Page

This report titled “Technical Report Summary on the Darling Range, Western Australia, S-K 1300 Report” with an effective date of December 31, 2024 was prepared and signed by:

SLR International Corporation

John R. Walker FGS, FIMMM, QMR
Technical Director, Mining Advisory Europe

Dated in UK

Signature Date: 20 February 2025