



# alcoa anglesea

environment report

glossary



australia's aluminium

The Anglesea Environment Report is a monthly publication aimed to communicate to our employees the interaction the power station and mine have with the natural environment and communicate environmental information to our stakeholders. In addition to covering the key areas of air, water, land and waste, the report also provides feedback on the targets and actions identified in Alcoa Anglesea's Environment Improvement Plan (EIP) aimed to improve the station's overall environmental performance.

This following Glossary is aimed to explain the environmental aspects as reported in the Anglesea Environment Report.

## air

### particulate matter

**Opacity** A measure of the particulates in stack gas emissions. Particulate matter is emitted by industry where there are any activities involving the movement of raw materials and combustion of fuels. They are also caused by lawn mowing, wood stoves, fires and cigarette smoke.

### sulphur dioxide

Sulphur dioxide (SO<sub>2</sub>) is formed by the combustion of materials containing sulphur or sulphur compounds. It is commonly used as a fruit-preserving agent, in wine making, as a bleach and as a fumigant for growing grains, grapes and citrus fruit. It is a colourless, non-flammable gas with the chemical formula SO<sub>2</sub>.

Sulphur is contained in the brown coal mined at Anglesea and SO<sub>2</sub> is produced when brown coal is burnt in the power station.

**Stack SO<sub>2</sub>** Sulphur dioxide is emitted from the exhaust stack at the power station is limited by the Power Station's EPA licence (EM32162) to 100 kg/min. At Alcoa Anglesea we have adopted an internal limit of 85kg/min.

**Ambient Monitors** Continuous monitoring of SO<sub>2</sub> ground level concentrations is currently conducted at six sites in Anglesea with direct reporting back to the station in real time. The EPA Intervention Level for SO<sub>2</sub> is 200 ppb averaged over a one-hour period, emanating from the Victorian EPA State Environment Protection Policy (SEPP) for Ambient Air Quality. At Alcoa Anglesea we adopt stricter internal limits of 170 ppb for hourly averaged data.

**Load Reduction** In the event that sulphur dioxide concentrations exceed alarm limits, a load reduction protocol is activated to reduce sulphur dioxide emission levels. This figure represents the number of megawatt hours (MWh) lost due to a reduced generation due to ground level SO<sub>2</sub> concentrations.

### greenhouse gas

Greenhouse gas (GHG) refers to the range of gases that contribute to the greenhouse effect. They include carbon dioxide, methane, perfluorocarbons, nitrous oxide, hydrofluorocarbons and sulphur hexafluoride. These form a blanket of gas that covers the earth, allowing light energy from the sun to reach the earth's surface, where it is converted to heat and other forms of energy. These gases in the atmosphere trap the heat before it can escape back into space. This is a natural effect, which keeps the earth warm and allows us all to survive.

This process occurs naturally and is accelerated by human activities such as power generation and everyday domestic activities such as use of fuel in cars, wood fires and home energy use. This enhanced greenhouse effect is referred to by scientists as climate change.

Carbon dioxide is the predominant greenhouse gas produced by the Anglesea Power Station although there is a range of other gases that contribute to the greenhouse effect. Carbon dioxide is generated principally by the combustion of carbon-based fuels.

**GHG Total Mt** A measure of the total tonnes of Greenhouse Gas emissions (Carbon Dioxide equivalent) generated by the power station and mine

**GHG Efficiency** A measure of the number of tonnes of CO<sub>2</sub> emitted per megawatt of net power generated

## water

### water storage

Barwon Water Geelong Region Storage levels provided for your information.

### water discharge

Process water and storm water from the site is discharged from the ash ponds (SP1). Mine water, not utilised in the station, is discharged from the reclamation pond (SP4). The discharge from this pond has been minimal with efforts made to reuse the water in the station.

Both discharges are EPA licensed and flow through a natural wetland mixing zone prior to entering the estuarine section of the Anglesea River via the final EPA licence point (SP3).

Anglesea's EPA Licence has parameters set on the following four characteristics:

pH	the pH scale is between 0 and 14 with neutral pH having a value of 7. Values below 7 and approaching 0 are increasingly acidic, while values from 7 to 14 are increasingly alkaline. Fresh waters are normally in the range of 6.5 - 9.0. Beyond these ranges there can be an impact upon aquatic invertebrates and fish spawning.
Suspended Solids	refer to matter suspended in water or waste water. Waters high in suspended solid analyses may be aesthetically unpleasing for such purposes as bathing. The power station uses settlement ponds to remove suspended solids from the ash water prior to discharge.
Colour	in surface and ground water results is primarily from the presence of natural organic matter; industrial waters can also contain organic and inorganic chemicals that cause colour. In the power station, this is primarily from high iron found in the bore water. The bore water is treated to remove the iron before it is used throughout the plant.
Metals	The key contaminants that are monitored with the effluent water are dissolved metals, primarily Aluminium, Zinc and Iron. The effects of metals in water range from beneficial to troublesome to toxic. Most metals tend to dissolve and impact upon receiving waters in acidic conditions so effluent discharge is routinely kept slightly alkaline.

### water use

The major water usage on site is to cool the return steam from the turbine. Other processes include boiler water feed, auxiliary cooling systems and dust suppression for conveyor belts and coal surfaces.

The station receives process water from three sources:

Town Water	The Alcoa Corporate target to reduce town water consumption by 60% from the 2000 baseline by 2010 was achieved in 2006.
Bore Water	Alcoa Anglesea's extraction of bore water is limited by a licence from the Southern Rural Water Authority for 4000 ML annually.
Mine Water	Mine dewatering is common for open pit mines to ensure wall stability and a safe workable pit floor surface.

## land

### rainfall

Monthly rainfall data from the Alcoa Anglesea weather station provided for your information

### plant / animal of the month

The Alcoa Anglesea site is located on the Anglesea Heath that consists of land leased by Alcoa from the State Government under the Mines (Aluminium Agreement) Act 1961 (7097ha) and an additional 124ha of freehold land owned by Alcoa. A unique agreement with State Government allows Alcoa to co-manage the area with Parks Victoria as if it were a National Park.

The area offers one of the most diverse and spectacular areas for flora, scenic landscape and wildlife communities in Victoria. Each month, a plant or animal species is profiled here.

## environmental improvement

Alcoa Anglesea regularly updates interested community members and Alcoa employees on the status of the actions contained in the Environmental Improvement Plan (EIP). The EIP can be found online at [www.alcoa.com/australia/en/info\\_page/EIP.asp](http://www.alcoa.com/australia/en/info_page/EIP.asp)

Reportable Environmental Incidents consists of non compliance with any of the licences and legislation applicable to Alcoa Anglesea.

**Env Near Miss Run Rate** This target aims to monitor the number of environmental near miss incidents versus the number of total environmental incidents. This data is taken directly from the Environment, Health and Safety Incident Management System each month. By setting a target and reviewing our progress in reporting, it promotes the need to be proactive when we identify potential environmental incidents in our workplace. Raising and reporting environmental near miss incidents may prevent a more systemic or significant incident from occurring.

**EHS ASAT** Alcoa has implemented a comprehensive environmental auditing program. One component of the auditing program is the Self-Assessment Audit. This is managed by personnel at each Alcoa location and reported via an Alcoa global web-based reporting tool on an ongoing basis. Each location is required to complete a self-assessment audit using the Alcoa Self Assessment Tool commonly known as ASAT. These internal audits must be completed every 12 months. The process is similar to that used during an integrated audit.

Environmental Health and Safety (EHS) areas covered by the audit system includes the plant's environmental management system, waste, water, air emission, chemical and land management systems. The process includes interviews, procedure reviews, site verification inspection and a review of the location's self assessment progress. The recent round of self assessments has seen the inclusion of Operational Excellence audits.

**Waste** All waste transported on or off site is recorded, regardless of whether the material is to be reused, recycled or sent to landfill. The Alcoa Corporate waste reduction target of waste to offsite landfill of 50% against a 2000 baseline was achieved in 2006.

**Mine Rehabilitation** The Alcoa Corporate standard for Mine Rehabilitation states that land cleared should be the minimum for efficient mining and rehabilitation and that every mining site must develop specific rehabilitation standards. With this in mind, Alcoa Anglesea has adopted a target to rehabilitate a greater area than the area cleared.

