Environment Protection Authority

National Pollutant Inventory South Australia summary report 2008–09

EPA South Australia

National Pollutant Inventory: South Australia summary report 2008–09

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Acronyms

ANZSIC	Australian and New Zealand Standard Industrial Classification
BOS	Basic Oxygen Steelmaking
EPA	South Australian Environment Protection Authority
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NPI	National Pollutant Inventory
PM_{10}	particulate matter less than 10 micrometres in diameter
SA	South Australia
WWTP	wastewater treatment plant

1 Introduction

Every year the South Australian Environment Protection Authority (EPA) provides a summary of the National Pollutant Inventory (NPI) in the state.

This summary report for the 2008−09 reporting year is an overview of the areas of focus for the NPI program. It discusses:

- industry emissions
- reporting transfers
- site audits
- tracking pollution in your neighbourhood.

Industry, governments and the community have comprehensive, free and easy access to information about reported substance emissions in Australia through the NPI internet database. Since 1998 many industrial and commercial facilities have estimated and reported their annual pollutant emissions. Diffuse emissions from sources such as motor vehicles and bushfires are less frequently estimated by government agencies.

When interpreting NPI data it is important to understand how the NPI works, including common causes of data variation and factors that contribute to the emissions. Industrial facilities around Australia estimate their emissions by a variety of methods: mass balance, engineering calculations, direct measurement (monitoring) and emission factors. Each reporting facility is required to calculate their emissions annually. Two factors—real changes (such as process changes) and estimation changes (such as variation in the calculation method)—influence the NPI calculation. For more information please refer to SA's NPI Interpretive Guide.

The EPA uses NPI data to assist in the management of regulatory effort for individual licensees. NPI data for key pollutants such as carbon monoxide, lead and compounds, oxides of nitrogen, particulate matter 10 µm (PM_{10}[1]), sulphur dioxide, volatile organic compounds, total nitrogen, total phosphorus, and zinc and compounds are used to measure the success of regulatory work undertaken by the EPA.

Acknowledgments

The SA NPI Team would also like to acknowledge the members of the EPA Licensing and Regulatory Services Branch and the NPI Operational Committee for their review of this report.

[1] PM_{10} is a measure of fine particles in the air which are smaller than 10 micrometres such as dust. A fact sheet with further information about PM_{10} can be found on the NPI website.

2 Industry emissions

Types of industries reporting

For the 2008−09 reporting period, the EPA received 447 NPI reports from industry which is a 1% increase from the 442 reports received in 2007−08. This is only a slight increase in new reporting facilities compared to previous years which have seen the number of reporters increase by an average of 5% per year over the past five years. The modest increase in new reporters is partly due to 20 facilities closing or dropping below threshold despite 25 new facilities reporting. Figure 1 shows an overview of the distribution of NPI reporting facilities in SA. The majority of sites are located around Adelaide.

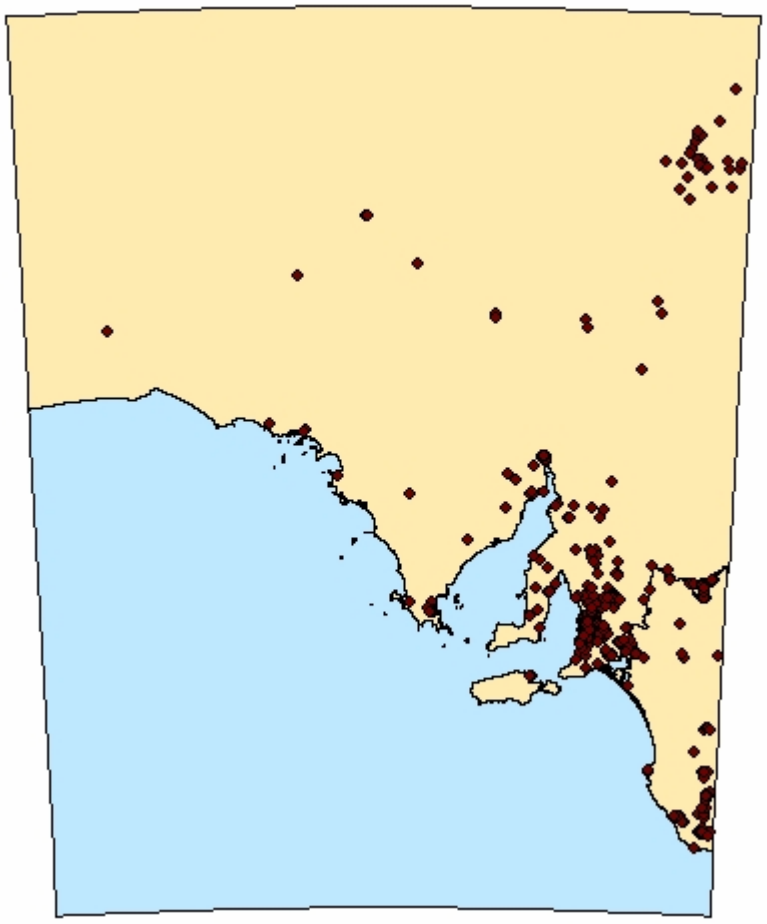

Figure 1 Distribution of NPI reporting facilities in South Australia

In 2008−09, reports were submitted from a range of Australian and New Zealand Standard Industrial Classification (ANZSIC)[2] industry sectors as shown in Figure 2. The number of facilities reporting across industry codes has remained relatively stable for the past few years. The Agriculture, Forestry and Fishing sector has seen an increase in reporting facilities due to the identification of new reporters in the piggery industry. The Manufacturing sector has seen a slight decrease in reporting facilities despite the inclusion of several Polymer Product and Rubber Product Manufacturers. This overall decrease is likely to be due to economic downturn which resulted in several facilities dropping below the NPI thresholds.

[2] For more information on ANZSIC industry sectors, go to <www.npi.gov.au/reporting/industry/anzsic-code-list.html>.

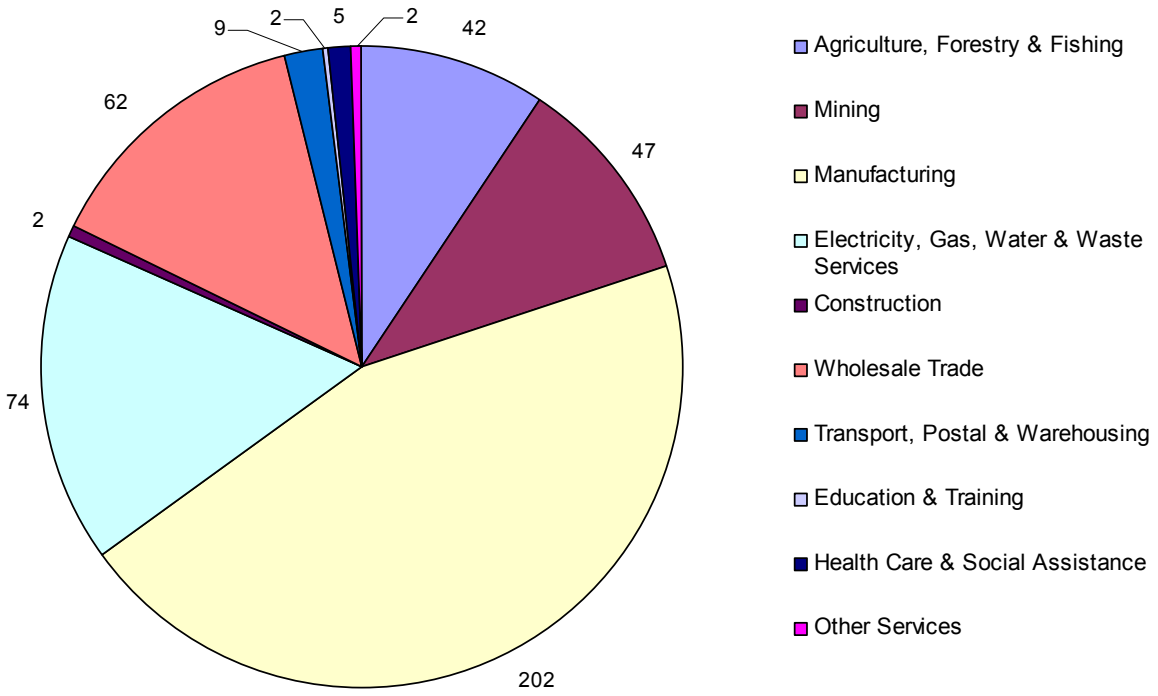

Figure 2 Proportions of ANZSIC industry sectors reporting to the NPI (as numbers of facilities per sector)

Case study—PM_{10} at OneSteel Whyalla Steelworks

Over the past three reporting years, the total emissions at OneSteel Whyalla for PM_{10} have decreased from 3,327 tonnes to 2,940 tonnes, a drop of 12%. The OneSteel Whyalla site is very large covering over 900 has and a significant component of NPI-reported PM_{10} emissions are those calculated using emission factors for open areas over the total area of the site. Because of the size of the site a large proportion of reportable dust is likely to remain on the site itself. The majority of the dust reduction over the last three years however has taken place at the pelletising plant located close to the east end of Whyalla meaning that the reduction has resulted in very real benefits to the community. The major reason that PM_{10} emissions have decreased from this site is the successful implementation of Project Magnet in late 2007. The conversion of the pellet plant from a dry haematite feed to a magnetite slurry feed has eliminated all the crushing and screening steps that were significant sources of coarse and fine particulates material. In addition the commissioning of a fully enclosed export shed has allowed OneSteel to close and commence remediation of the northern stockpile which was previously used to store and blend export material.

The next major project in further reducing particulate emissions from the site is to refurbish the three electrostatic precipitators that clean gases from the Basic Oxygen Steelmaking (BOS) plant. The first refurbishment took place in 2009 and the next two should be refurbished over the period 2010–12.

Other measures that have been implemented in order to decrease dust at the steelworks include:

- increasing the availability of recycled water for road watering
- closing off and capping disused areas
- ensuring all potentially dust-generating activities have environment management plans in place before they start
- introducing an improved paper pulp mix to control dust from stockpiles
- awareness campaigns, and a fugitive dust standard for use by operators
- a Dust Control Network to continually monitor and report fugitive dust emissions that have the potential to impact on the community allowing controls to be put in place.

Figure 3 Aerial view of the OneSteel Plant since the conversion to magnetite slurry feed

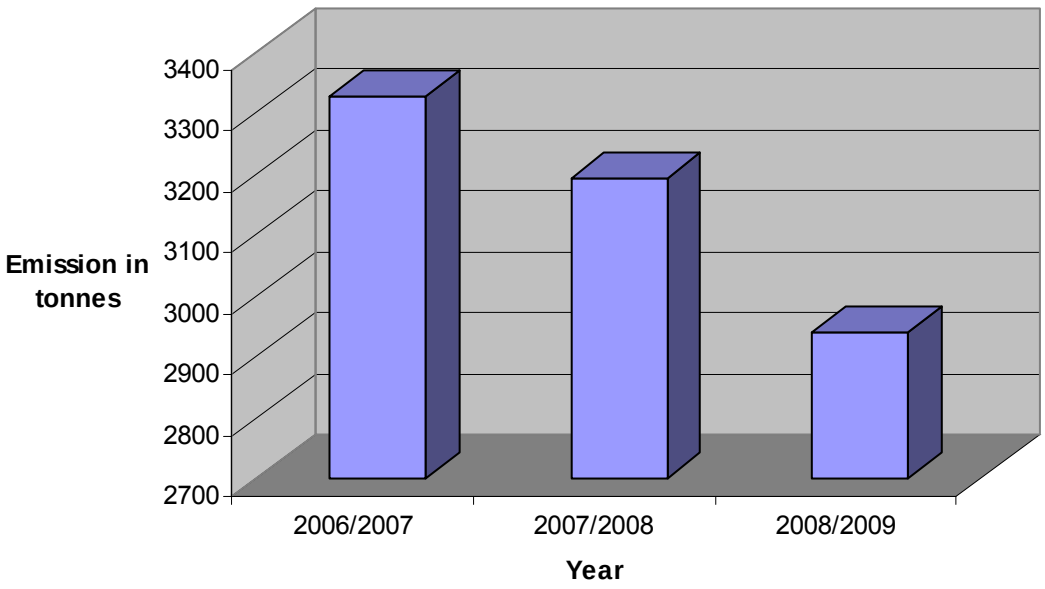

Figure 4 Comparison of total PM_{10} at OneSteel Whyalla from 2006–07 to 2008–09

Figure 5 shows information which has been published on the NPI website about various cleaner production activities and pollution control devices for the OneSteel Whyalla site. The decrease in PM_{10} is a great achievement and the NPI website is a useful platform for companies such as OneSteel to inform the community about improvements in emissions.

Cleaner Production Activities

Activity	Comments
Modified process, equipment, layout, or piping	All crushing and screening of ore conducted at the mine site. Export ore is shipped via fully enclosed conveyors with baghouses.
Improved procedures for loading, unloading or transfer operations	Fully enclosed conveyors with baghouses
Changed product specifications	Pelletising plant uses Magnetite which is shipped in as a slurry. Previously used Haematite
Dust suppression - water sprays/chemical suppression	Incoming and outgoing trains pass under water sprays to minimise fugitive dust.
Dust suppression - wind breaks/covered/enclosed stockpiles	Stockpiles of coal and some ore are sprayed with paper mache to suppress dust.

Pollution Control Devices

Device	Installed (year)	Comments
Electrostatic precipitator	1981	Two installed 1981 and a third in 1992
Fabric filter/baghouse	1995	First installed at Blast Furnace. Many others throughout the plant since. Steel making have 2 new baghouses for Hot metal fume emission control.
Wet scrubber	1998	Used at the Waste Gas Cleaning Plant at the Pellet Plant
Dust monitor	2007	A system of continuous monitors linked by computer to determine sources of dust.

Figure 5 Cleaner production activities and pollution control devices reported by OneSteel Whyalla in the 2008–09 NPI Report

Trends in total nitrogen and total phosphorus

Nitrogen and phosphorus are mineral nutrients that are essential for all forms of life. Total nitrogen and total phosphorus refers to the amounts of those nitrogen and phosphorus compounds that give rise to nitrate/nitrite and phosphate ions respectively (DEWHA 2010).

High total phosphorus levels together with high total nitrogen levels, in conjunction with other necessary nutrients and favourable physical characteristics of aquatic environments, can result in plant and algal blooms and epiphyte growth on seagrass leading to loss of seagrass (EPA 2009a).

Most total phosphorus and total nitrogen are transported by processes such as runoff and streamflow, and sometimes groundwater flow, although wind also transports nutrients around the landscape in dust. Adelaide's coastal zone receives input from a variety of different point and diffuse sources including rivers, streams, creeks, groundwater, rainfall, drains, wastewater treatment plants (WWTPs) and some industrial sources (EPA 2009b).

Figure 6 shows the total nitrogen and total phosphorus load to water from industrial point sources in South Australia. The trend shows both total nitrogen and total phosphorus are in decline since the establishment of the Adelaide Coastal Waters Study (ACWS) in 2001 by the EPA in response to ongoing concerns about the decline in coastal water quality and loss of seagrasses.

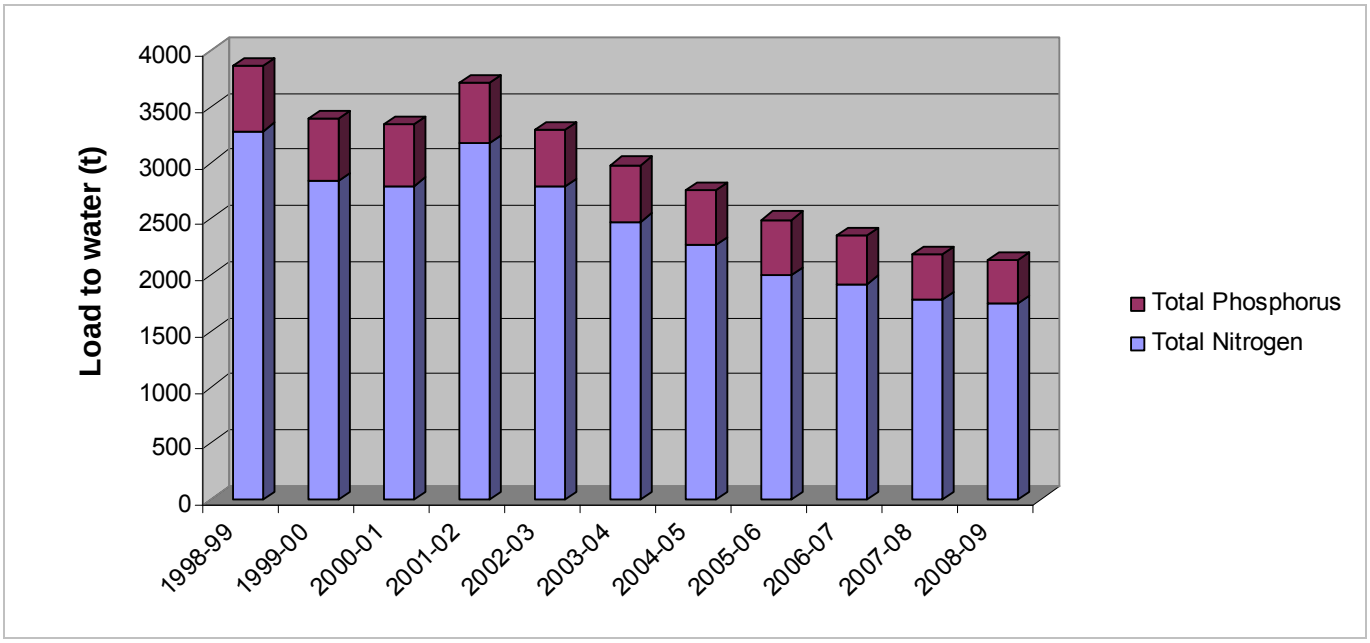

Figure 6 Total phosphorus and total nitrogen discharged to water in SA from industrial sources

Penrice Soda and WWTPs contribute significant amounts of total nitrogen to the coastal zone. These industrial sources have managed to reduce their total nitrogen discharges to Adelaide's coastal zone as seen in Table 1. Licence conditions put in place by the EPA have led to improvements in Penrice Soda's processes and have resulted in a decrease in total nitrogen discharge.

A combination of improved operation of treatment plants and decreased sewage flows in response to water restrictions over the period 2003–09 have led to the decrease in total nitrogen from the WWTPs. The decrease in sewage flows has led to greater efficiency in the treatment of nutrients.

Table 1 Total nitrogen load discharged to Adelaide coastal waters in 2000–01 and 2008–09 by key industrial point sources

Source	2000–01 (tonnes)	2008–09 (tonnes)	% Decrease
Penrice Soda	850	607	29
Bolivar WWTP	1036	515	50
Glenelg WWTP	459	204	55
Christies Beach WWTP	252	113	55

For more information on the ACWS including the final report and recommendations, please see <www.epa.sa.gov.au/environmental_info/water_quality/projects/adelaide_coastal_waters_study>.

3 Reporting of transfers

The reporting of transfers as part of the NPI program was introduced as part on the NEPM variation in 2007. A transfer, by definition in the NPI National Environment Protection Measure (NEPM), is the 'transport or movement, onsite or offsite, of substances to a mandatory reporting transfer destination or a voluntary reporting transfer destination'. However transfers do not include 'the transport or movement of substances contained in overburden, waste rock, uncontaminated soil, uncontaminated sediment, rock removed in construction or road building, or soil used for the capping of landfills' (NEPC 2008). As of the 2008 calendar year reporting period, both mandatory and voluntary waste transfer reporting provisions have come into effect.

It is now mandatory for reporters to include transfers containing NPI substances to:

- long-term containment facilities such as landfill, tailings storage facilities, underground injection or purpose-built storage structures
- a destination to be destroyed
- an offsite sewerage system
- an offsite facility which leads to one of the above mentioned destinations.

Reporters can also voluntarily report transfers containing NPI substances for:

- reuse
- recycling
- reprocessing
- purification (wholly or partially)
- immobilisation
- remediation
- energy recovery.

Table 2 Percentage of transfers going to voluntary destinations in Australia

State or territory	Transfers to voluntary destinations (%)
Victoria	24
South Australia	22
Queensland	14
New South Wales	10
Tasmania	8
Northern Territory	6
Western Australia	4
Australian Capital Territory	0

The NPI data from 2008–09 include transfers for the first time. Australia-wide, 4,698 transfers were reported. Of these, 347 were from facilities in SA. The majority of SA transfers were to mandatory destinations (78%) with 22% of transfers going to voluntary destinations.

Reporting voluntary transfers offers a great opportunity for companies to showcase their waste minimisation and sustainable activities to the public. SA has a great reputation for leading the nation with recycling and waste minimisation through the establishment of the Container Deposit Legislation and the promotion of waste management reform and energy recovery. South Australia is ranked second in Australia with the largest percentage of NPI transfers going to voluntary destinations (Table 2).

Of all of the voluntary transfer destinations reported in SA, the most common destinations included recycling, reprocessing and reuse (Figure 7). In particular, the wine manufacturing industry represents a large percentage of voluntary transfers. A large number of SA wineries reported voluntary transfers of ethanol to be recycled or reprocessed offsite. The ethanol contained in marc (grape flesh, skins and seeds) is sent offsite for reprocessing at plants such as Tarac Technologies which are able to extract remaining ethanol for spirit manufacture.

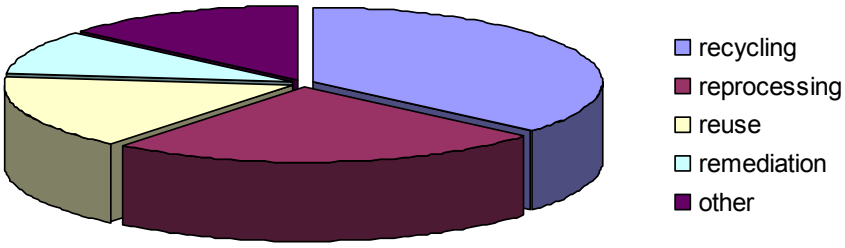

Figure 7 Distribution of voluntary transfer destinations in South Australia

An example of a facility which is excelling at environmental performance and improving their sustainability is The Yalumba Wine Company which recently became the first company to receive an Accredited Sustainable Licence from the EPA. Yalumba transferred 1,380 tonnes of marc to be reprocessed at Tarac Technologies last year. They are also industry leaders when it comes to winery wastewater management and beneficial wastewater reuse.

Further information on transfers can be found in the *Transfers Information Booklet* which is available on the NPI website. This booklet also contains a guide for specific industries on whether certain waste streams are emissions or transfers. The NPI Guide has also been updated and includes a section explaining what transfers are.

4 Site audits

In 2009 the SA NPI team carried out four site audits. The objectives of these audits were:

- to satisfy our agreement with the Australian Government to undertake compliance activities including onsite audits where necessary
- to ensure a complete and accurate NPI report is submitted by a facility.

The audit included:

- inspecting the facility to gain a greater understanding of the processes undertaken at the facility
- ensuring that all pollution sources were identified and included in their report
- assisting with any pollution emission estimate calculations and the understanding of guidance material
- determining if there are any further ways that the NPI team can assist with reporting
- developing a list of recommendations for each facility to be implemented and included in their next NPI report.

For the audits carried out, improvements were needed for the following areas:

- consideration of all Category 1 substances
- cross checking of data
- consideration of fuel/chemical storage emissions
- errors in emission estimation calculations

The results of these audits can be used by other NPI facilities to gauge where improvements could be made in the process of NPI reporting. An audit checklist is available for facilities to check their procedures. The *National Pollutant Inventory audit report 2009* and the *NPI audit checklist* can be found in the Reports & updates section of the EPA website.

If you are interested in an audit for your facility, please contact the NPI team.

5 Tracking pollution in your neighbourhood

The NPI has pollutant emissions from various industrial facility sources, and diffuse sources. Diffuse sources are from small facilities, transport and households and are not updated every year. Industrial sources are from industries that trip the NPI thresholds and report their emissions and transfers annually to the NPI.

It is easy to find out about sources of pollution in your neighbourhood on the NPI website. You can search NPI data by postcode, local government area, airshed, water catchment or individual facility.

Search by form allows a search for NPI data using any combination of source data type, geographic region, substance, industry source, or diffuse source. A default search will return all NPI data for the latest reporting year. Choosing additional criteria will narrow the search results. For example, to search for the latest SA data, leave the year selected to the default and select SA from the State/Territory drop-down, then click the Search button.

Below are some examples of how to find information using NPI search functions:

Example 1 Postcode search

This search will generate a report with summary information about top emission sources by substance and a map of industrial facilities in the area. To find the search display, go to the NPI website and click on the link called NPI Data and then Search for NPI data.

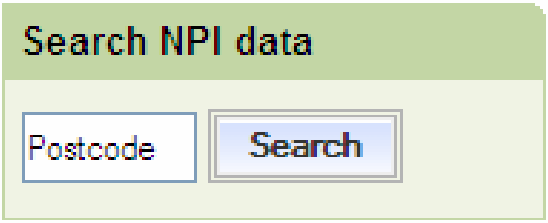

Figure 8 Search for NPI data display on the NPI website

Once you have entered the postcode you are interested in a summary is presented to give information about the number of facilities, substances emitted and transferred and airsheds in the selected postcode. Figure 9 shows the summary of data for the postcode 5355 (Nuriootpa). For further information you can click on the tabs to find out more about the sources, emissions, transfers, view a map or download raw data. The markers on the map in

Figure 10 represent facilities that report to the NPI. When a marker is clicked on, the facility name, street address and primary ANZSIC code are provided in a pop-up box. A link is provided to view the most recent NPI data of that facility.

You are here: NPI Home » NPI data » Search NPI data » Search by Form » View data

Summary | Sources | Emissions | Transfers | Download | Map

2008/2009 data within 5355 - All Substances from All Sources

Summary of returned search results with information related to the search criteria. Click on the tabs for a more detailed view of the search results.

The search results contain the following data

Industry data		Diffuse data	
▪ **Number of facilities**	10	▪ **Number of airsheds**	2
▪ Number of substances emitted	20	▪ Number of substances emitted	63
▪ Number of substances transferred	2	▪ **Number of catchments**	1
		▪ Number of substances emitted	2

Most commonly reported substances for the Location: 5355

Industry Emissions	Industry Transfers	Diffuse Emissions
▪ Total Volatile Organic Compounds	▪ Ethanol	▪ Total Volatile Organic Compounds
▪ Ethanol	▪ Methanol	▪ Toluene (methylbenzene)
▪ Sulfur dioxide		▪ Xylenes (individual or mixed isomers)
▪ Carbon monoxide		▪ Benzene
▪ Oxides of Nitrogen		▪ Ethylbenzene

Display time: 0.452s

Accessibility | Disclaimer | Privacy | © Commonwealth of Australia

Figure 9 Summary of data for postcode 5355 Nuriootpa

You are here: NPI Home » NPI data » Search NPI data » Search by Form » View data

Summary | Sources | Emissions | Transfers | Download | Map

2008/2009 data within 5355 - All Substances from All Sources

A map of all facilities which match the current search results. Markers with numbers indicate the number of facilities in an area. Markers with no numbers indicate the location of an individual facility. At higher zoom levels, the number of markers with numbers will decrease. Click on a facility marker (a marker with no numbers) to view a facility's annual report.

We have detected that you are using Internet Explorer. To improve performance of the maps, you can either install the "Chrome Frame" plug-in for Internet Explorer by clicking here or by using another web browser (eg. Firefox, Chrome).

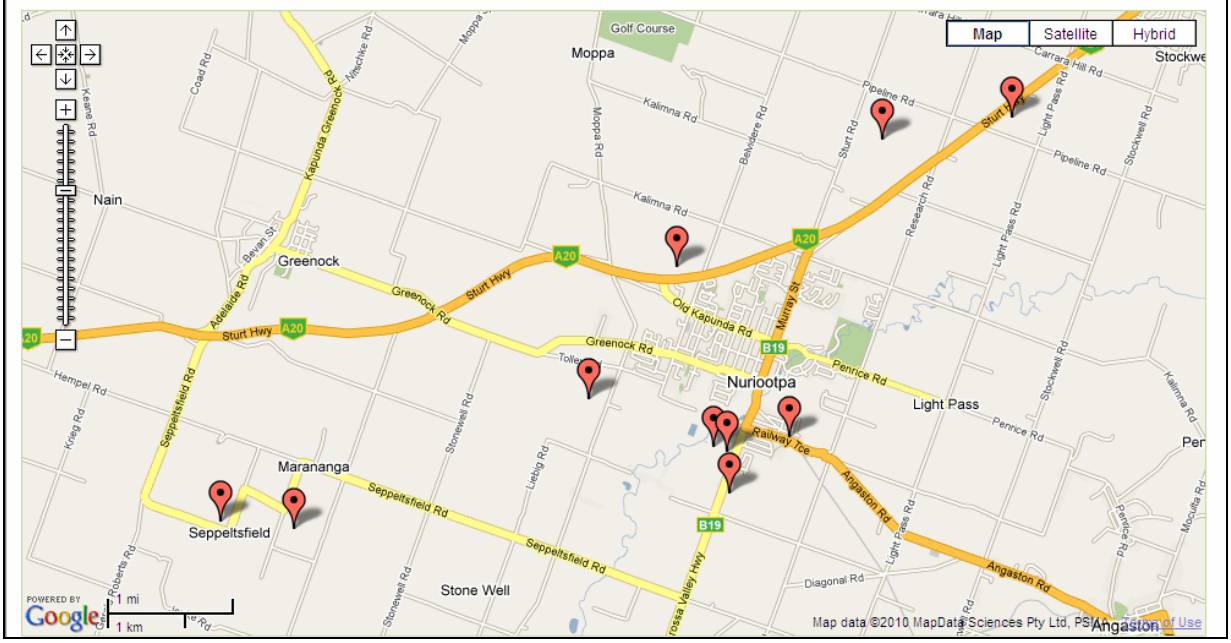

Figure 10 Map of facilities reporting for postcode 5355 Nuriootpa

Example 2 Search by map

Navigate the map of Australia to locate a facility and view its report for the selected reporting year. Markers with numbers indicate the number of facilities in an area. Markers with no numbers indicate the location of an individual facility. At higher zoom levels, the number of markers with numbers will decrease. Click on a facility marker (a marker with no numbers) to view a facility's annual report. Figure 11 shows how *Search by map* is displayed in Google maps when zoomed to SA. Under search options the reporting year can be altered and a shape can be selected to search for facilities. The circle shape can be used to determine which facilities are within a certain radius of a selected site.

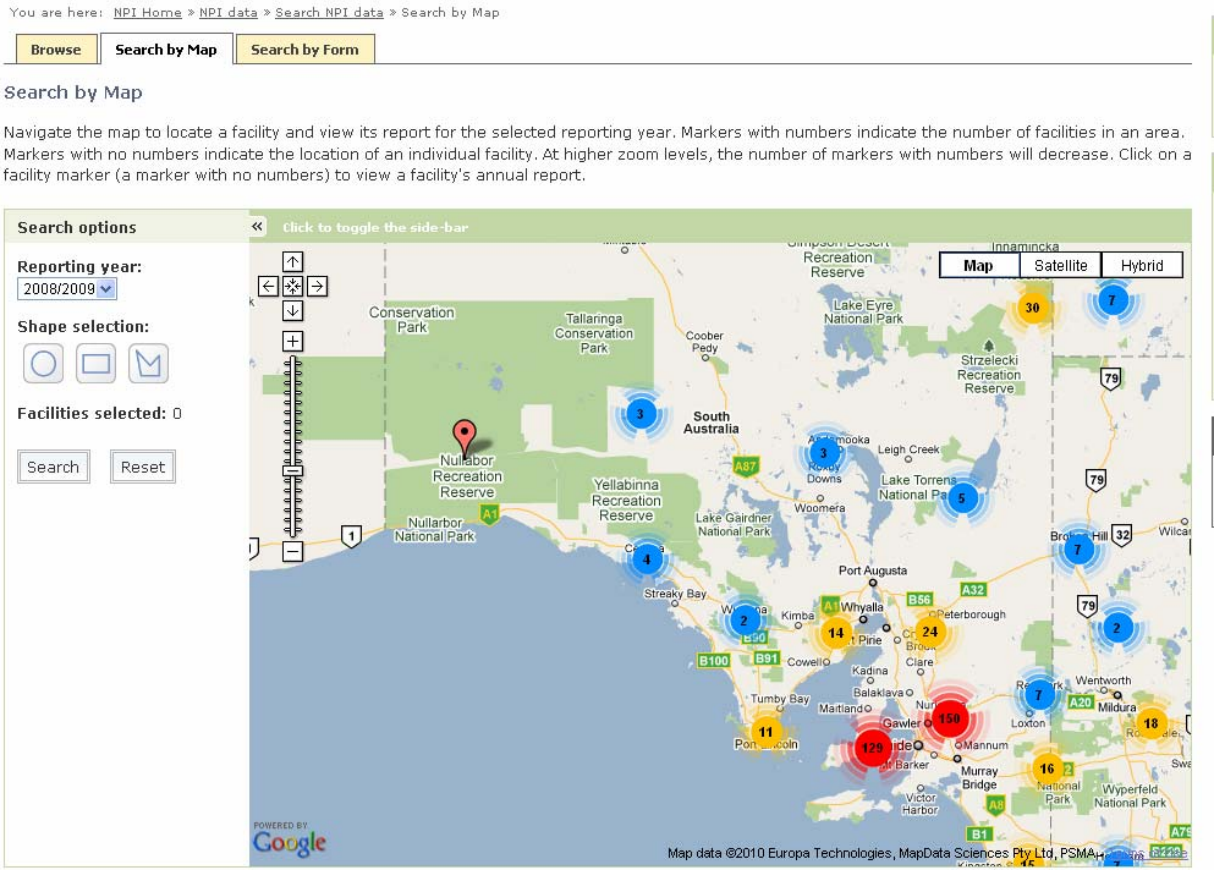

Figure 11 Search by map

Example 3 Find a facility using Search by form

This search will generate a report with information about company details, emissions for each substance and reduction activities for an individual facility. To find the facility search display go to the NPI website and click on the link called *Search by form*. For the Source type data, choose Facility (Industry). Then type the name of the facility you are looking for and click search. On the Sources tab, click on the facility name to go to the individual facility details. From this page it is also possible to look at the data from previous years.

New Castalloy has been used as an example of using Search by form in Figure 12.

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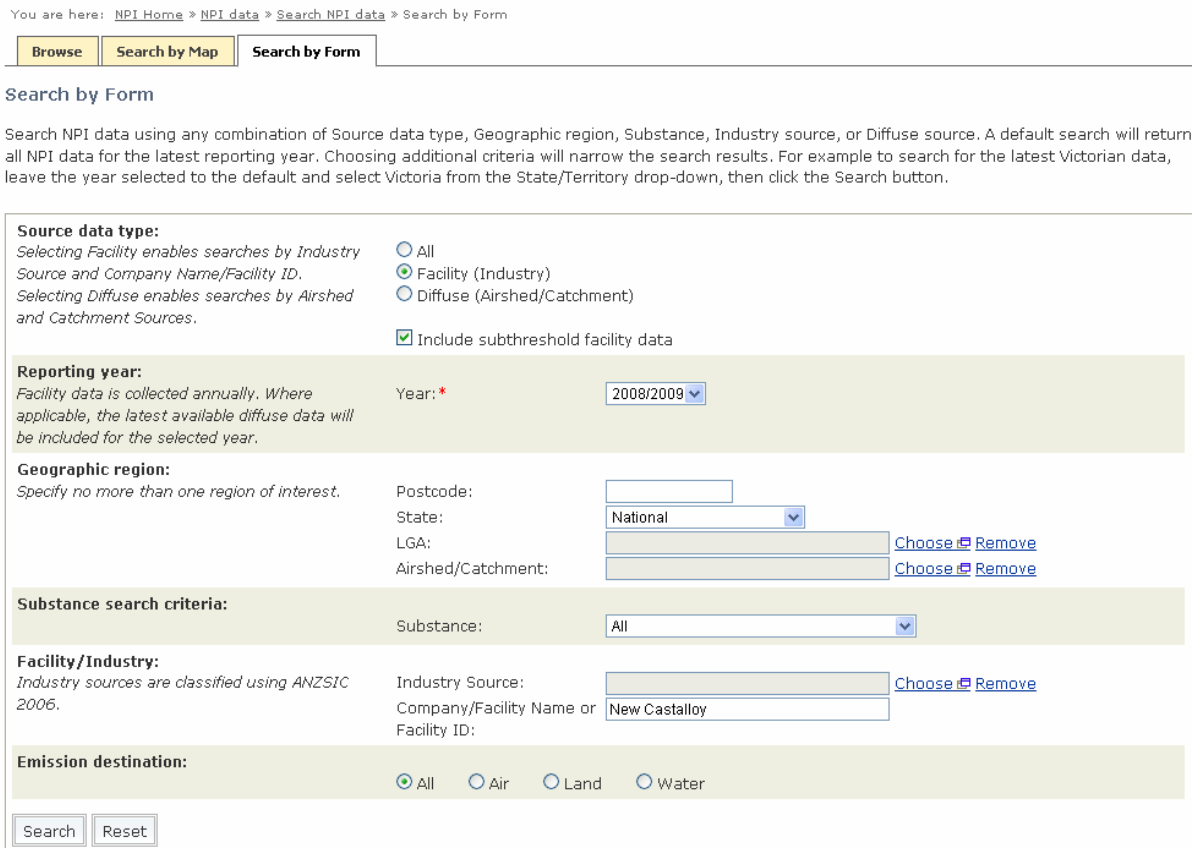


Figure 12 [Search by form]

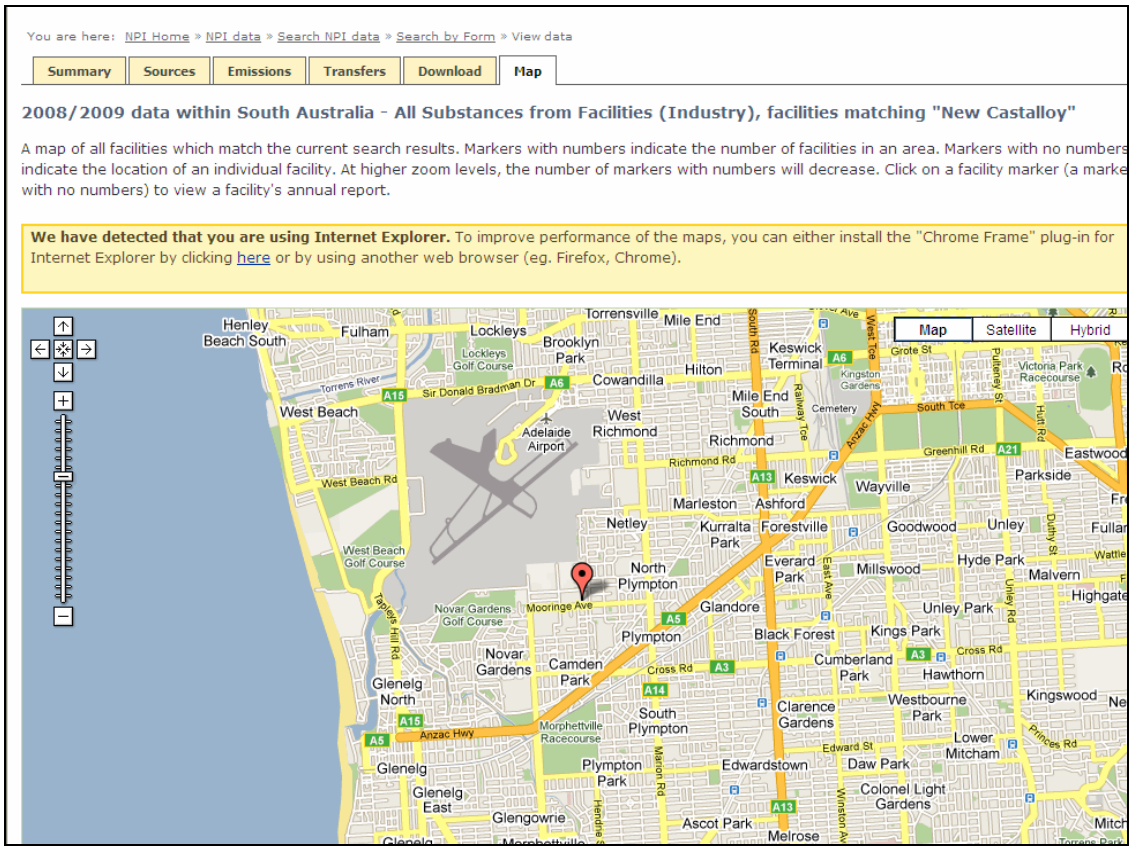
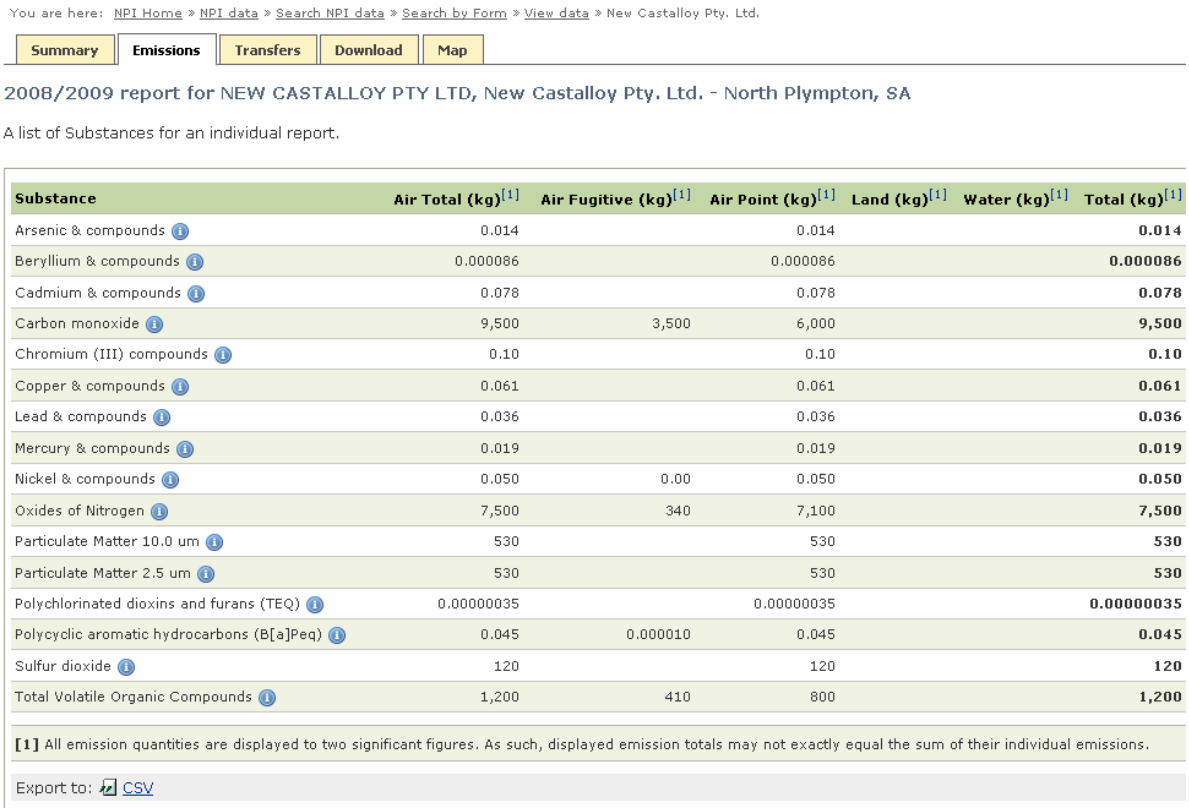


Figure 13 **Location map for New Castalloy**

The location map for New Castalloy is displayed in

Figure 13. It is possible to zoom in on this map to view greater detail.

As shown in
Figure 14, total emissions are displayed and broken down into air point and air fugitive, land and water. At the top of the screen you can see the pathway taken to get to the current screen. If you wish to find more information on a certain substance, you can click on the blue info 'i' button on the right of each substance.



You are here: NPI Home » NPI data » Search NPI data » Search by Form » View data » New Castalloy Pty. Ltd.

Summary | Emissions | Transfers | Download | Map

2008/2009 report for NEW CASTALLOY PTY LTD, New Castalloy Pty. Ltd. - North Plympton, SA

A list of Substances for an individual report.

Substance	Air Total (kg)[1]	Air Fugitive (kg)[1]	Air Point (kg)[1]	Land (kg)[1]	Water (kg)[1]	Total (kg)[1]
Arsenic & compounds	0.014		0.014			**0.014**
Beryllium & compounds	0.000086		0.000086			**0.000086**
Cadmium & compounds	0.078		0.078			**0.078**
Carbon monoxide	9,500	3,500	6,000			**9,500**
Chromium (III) compounds	0.10		0.10			**0.10**
Copper & compounds	0.061		0.061			**0.061**
Lead & compounds	0.036		0.036			**0.036**
Mercury & compounds	0.019		0.019			**0.019**
Nickel & compounds	0.050	0.00	0.050			**0.050**
Oxides of Nitrogen	7,500	340	7,100			**7,500**
Particulate Matter 10.0 um	530		530			**530**
Particulate Matter 2.5 um	530		530			**530**
Polychlorinated dioxins and furans (TEQ)	0.00000035		0.00000035			**0.00000035**
Polycyclic aromatic hydrocarbons (B[a]Peq)	0.045	0.000010	0.045			**0.045**
Sulfur dioxide	120		120			**120**
Total Volatile Organic Compounds	1,200	410	800			**1,200**

[1] All emission quantities are displayed to two significant figures. As such, displayed emission totals may not exactly equal the sum of their individual emissions.

Export to: CSV

Figure 14 Emission data for New Castalloy for reporting year 2008–09

Each facility has the option of voluntarily reporting any emission reduction activities implemented at their site and pollution control equipment. This allows facilities to promote waste minimisation, cleaner production and energy and resource efficiency (Figure 15 and 16).

Cleaner Production Activities

Activity	Comments
Improved maintenance scheduling, record keeping, or procedures	All pollution control equipment is in Computer based MAINPAC system & is also part of the EMS. Maintenance hours dedicated to pollution control equipment is reported into Environmental steering committee meeting.
Change from solvent based to aqueous based raw materials	Sand core painting is now ater based compared to solvent based
Modified process, equipment, layout, or piping	Use of more energy efficient furnace for melting metal. Changed procedure for cleaner nickel pads , so we can recyle nickel solution. Reduced water usage by redesigning presure tester parameters.
Improved procedures for loading, unloading or transfer operations	Consolidated premachining operations (desprue & riser cut off), so eliminated a load & unload.
Installation of high-pressure/low-volume cleaning equipment	Dry Ice blaster to clean casting dies
Installed overflow alarms or automatic shut-off valves	Installed petrol bowser style nozzle to fill coolant tanks to minimize coolant/ water overflows.
Changed product specifications	We purchase pre alloyed ingot rather than silicon inject on site, like we have done in the past
Implemented inspection or monitoring program for potential spill or leak sources	Maintenence has continued to improve. We were certified to ISO 14001 in Sept 2007 & recertified in Aug 2008, with no non conformances.
Dust suppression - water sprays/chemical suppression	Operational conrol procedures to control dust
Dust suppression - wind breaks/covered/enclosed stockpiles	All waste has been consolidated in one location, under cover.
Community consultative committee	Annual Public meeting held last October, with great success. Next meeting in Oct. 2008. Consultative committee meetings are held every quarter.
Other modifications / practices	Installed filter baskets in storm water outlets to catch debris, like ear plugs and leaves. Installed a second PH controlled Gross Pollutant trap. Started a coolant, water recovery system from swarf generated in the machine shop. Consolidated 2 pre machining operations into one, to reduce noise, water, cutting oil, transport.

Figure 15 Cleaner production activities for New Castalloy for reporting year 2008–09

Pollution Control Devices

Device	Installed (year)	Comments
Fabric filter/baghouse	2000	
Wet scrubber	1997	
Dry scrubber	2000	
Incineration/afterburner	2000	
Wastewater treatment	2006	

Figure 16 Pollution control devices for New Castalloy for reporting year 2008–09

6 More information

The NPI website

- The NPI database and website is the primary location for obtaining information relating to the NPI. All emission data used in this report can be obtained from the NPI database. The website also contains information on reporting to the NPI, calculating emissions, searching the database and details of the NPI substances and their chemical properties. The NPI national website has undergone a complete facelift in 2009. In additional a new section specifically for students and teachers has been added. Resources such fact sheets, a quiz and an interactive map help kids to learn about sources of pollution. This links in with the Australian Sustainable Schools Initiative.

The EPA website

- The EPA website was redesigned in 2009 and has become more user friendly. For NPI information specific to SA, go to <www.epa.sa.gov.au/npi>. This site contains publications such as previous annual summary reports and an Interpretive Guide which contains information of industry vs aggregate data, important tips on interpreting the data, and common errors that result in misinterpretation. A brochure outlining the NPI reporting requirements is also available.

The SA NPI team

- If you have any queries in relation to this document or the NPI in general, the SA NPI team can be contact via email or phone on 8204 9095.

7 References

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