



**2013 Environment Management System
&
Community Engagement Report**

March 21, 2014

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Summary

Nickel and sulphur dioxide (SO₂) Site Specific Standard Approvals were issued to Vale's Ontario Operations for its Copper Cliff Smelter Complex in 2011 and 2012, requiring the implementation of communication and community engagement plans and the formation of an Environmental Monitoring Team (EMT). This second annual report documents 2013 community activities and environmental accomplishments. A number of events and meetings were held in 2013, in an effort to deliver information to the community about Vale's environmental activities and initiatives. These include the annual Open House, EMT and Copper Cliff Liaison Committee (CCLC) meetings.

Vale's new corporate website, www.vale.com/canada, was launched in 2013. Current and recent environmental monitoring results, real-time, recent and historical monitoring results, details about monitoring programs, emission reduction and dust emissions controls, and information on other environmental initiatives are posted on this website at:

<http://www.vale.com/canada/EN/aboutvale/communities/health-safety-environment/our-environment/air-quality/sudbury-air-quality/Pages/default.aspx>

Metals such as nickel and cobalt were measured at a number of stations in the community in 2013, with all concentrations measured to be below their allowable air quality standards and guidelines. There were four instances when the 1-hour Ambient Air Quality Criteria of 250 ppb for SO₂ was exceeded; a limit that doesn't apply to the Smelter until 2017. There was no "on-the-hour"-averaged SO₂ levels calculated to be above the 1-hour "Measured Level above which, Trigger Action" limit of 340 ppb and two instances when the "rolling" 1-hour average SO₂ levels exceeded the 340 ppb limit. There were no exceedances of the 24-hour provincial air quality standard of 100 ppb in 2013.

There were approximately the same number of complaints logged in 2013 as in 2012 (just over 300 in total); all complaints were documented, investigated and followed up.

Action plan updates continued to be submitted to the Ministry of Environment and posted on the website twice per year at the end of March and September.

1.0 Background

The Vale Smelter in Copper Cliff has a number of air- related approvals from the Ministry of Environment:

Amended Environmental Compliance Approval # 6785-9BXPTC

Nickel Site Specific Standard Approval (24-hr) # 501-11-rv0

Nickel Site Specific Standard Approval (annual) # 502-11-rv0

Sulphur Dioxide Site Specific Standard Approval (1-hr) # 503-12-rv0

Sulphur Dioxide Site Specific Standard Approval (24-hr) # 504-12-rv0

The Site Specific Standard Approvals contain a requirement to form an Environmental Monitoring Team (EMT) with representation from the community, the Ministry of Environment and Vale. The purpose of the EMT is to serve as a forum for dissemination, consultation, review and exchange of information regarding the operation of the Smelter, environmental issues such as air monitoring, and analysis of monitoring data, and the need for any new or amended Ministry Approvals.

The group was formed by inviting members of an existing community stakeholder group, the Copper Cliff Liaison Committee (CCLC), which includes representation from the Ministry of Environment, and two members of the Gatchell Community Action Network, to participate. Though the actual EMT requirements varied between the Approvals, the group decided that one EMT would be appropriate to address all community engagement.

This report documents the work of the Environmental Monitoring Team and the communications activities undertaken by Vale in 2013.

2.0 Communications and Community Engagement

The Environmental Monitoring Team (EMT) formed a communications sub-committee to develop the communications plan. The communication sub-committee met several times in 2012 and developed the communication plan (provided in 2012 report), which includes context for the plan, a strategic approach and details on existing and new communication channels to be leveraged. Some of the communication channels that are detailed in the plan are:

- A new sustainability website
- The Clean AER Project website and video
- The new annual Report to Community
- Air monitoring station signage
- Walking tours of re-greened areas
- Annual Open House
- Vale's Community Concerns Line
- Meetings with community groups

Execution of the communication plan continued throughout 2013. The Communications sub-committee met four times in 2013, and discussed a variety of topics, including improvements to existing communication channels and reports, and planning future

events to educate the public on environmental initiatives undertaken by Vale. The full EMT received updates of monitoring results, action plan progress, and communications initiatives in March and November.

Vale's new corporate website, www.vale.com/canada, went live in 2013 to include information on a number of Vale initiatives and topics. The environmental elements that fulfill the site specific standard approval requirements can be found on the website at:

<http://www.vale.com/canada/EN/aboutvale/communities/health-safety-environment/our-environment/air-quality/sudbury-air-quality/Pages/default.aspx>

The air quality documents posted on this site include:

- Most recent and historical metals and SO₂ monitoring results (reported quarterly);
- Glossary of terms;
- Details about the monitoring and emission reduction programs; and
- Information about dust emission controls.

The website also includes information about Vale in the community as well as information about the Company's water, reclamation and decommissioning management activities.

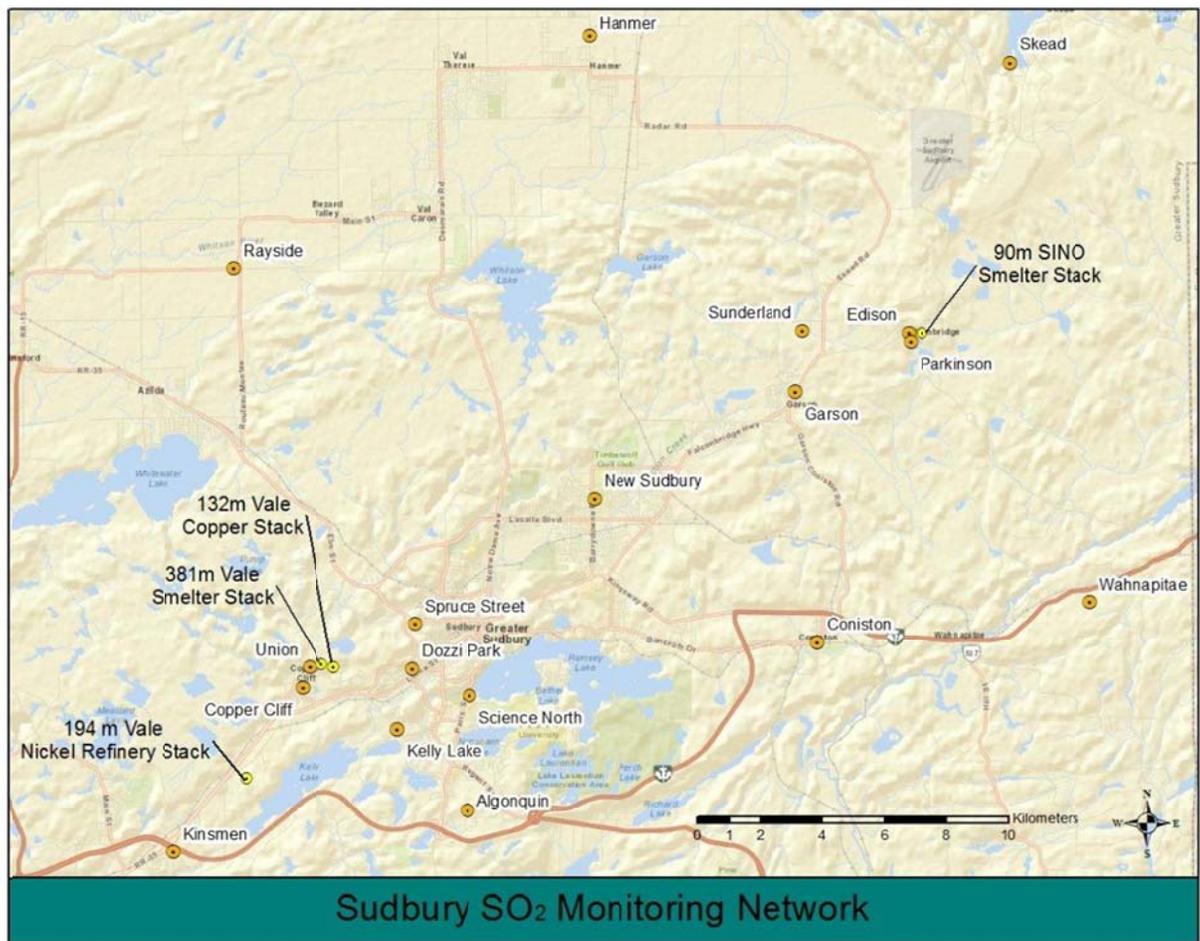
Vale's annual Open House was attended by over 70 local residents on September 25th, 2013. It provided an opportunity for Vale to provide updates about Vale's air monitoring networks, the Clean AER Project and Vale's Action Plans for the site-specific standard approval for SO₂ and nickel. Information on other environmental initiatives such as re-greening, water management and dust control was also provided to the community for feedback. Some photos from the September Open House are provided below.



3.0 Community Air Quality Monitoring

Sulphur Dioxide

There are 18 fixed continuous SO₂ monitoring stations located in the community, owned by Vale and Sudbury Integrated Nickel Operations (INO Glencore/ formerly Xstrata), and operated and maintained by Bestech Ltd. In addition, the network includes the operation of two meteorological towers and Vale's mobile SO₂ monitoring unit. The mobile unit is used to measure ground level concentrations of SO₂ in areas of the community not covered by the 18 fixed stations. A map indicating the location of the stations is provided below.



In addition to the real time monitoring data, quarterly and annual reports of SO₂ concentrations measured at the fixed stations are compiled and reported by an independent consultant; the reports are posted on the Vale website as soon as they become available from the consultant.

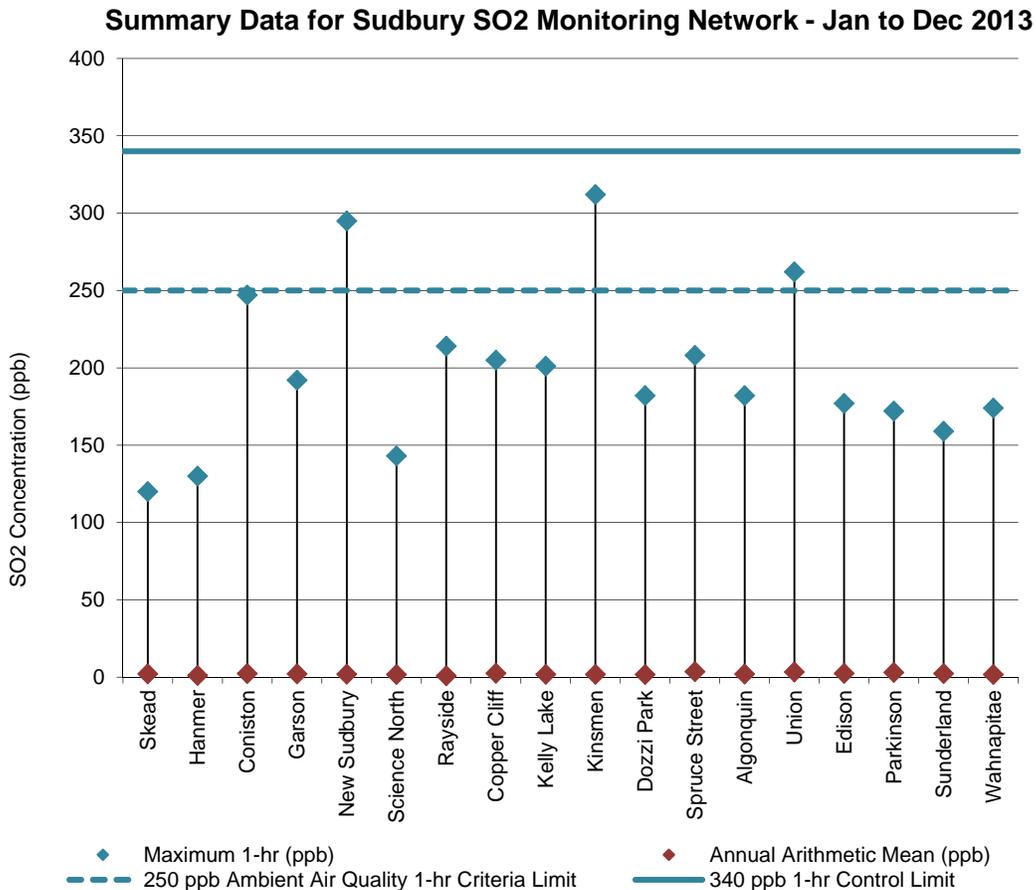
A summary of the SO₂ measurements made in 2013 at all of the 18 stations is provided in the graphs below. Low SO₂ levels were measured for the majority of the year; all stations were calculated to have annual arithmetic mean concentrations that were less

than 4 ppb in 2013. There were no exceedances of the 24-hour provincial air quality standard of 100 ppb in 2013. Based on the standard methodology of reporting on the clock hour (eg., at 11:00, 12:00, 1:00), no exceedances of the 1-hour SO₂ “Measured Level above which, Trigger Action” limit of 340 ppb were recorded.

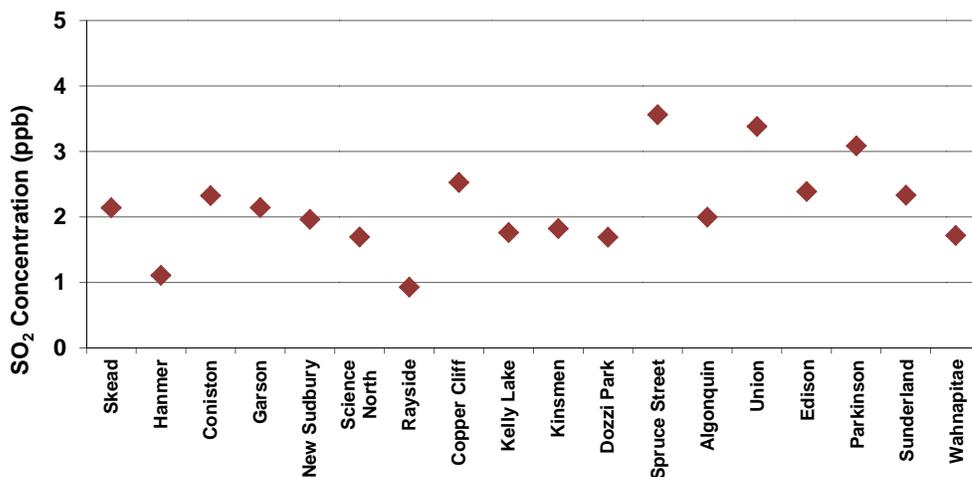
In addition to the provincial standard clock hour basis, Vale is also required to calculate a rolling-1-hour average. This consists of the average 1-hour concentration calculated and recorded every 5 minutes (eg. 1-hour average recorded at 11:45 represents the average of all readings taken during the period from 10:46 to 11:45; 1-hour averaged recorded at 11:50 represents the average of readings taken from 10:51 to 11:50, etc...), resulting in 24 x 12 = 288 1-hour “rolling” averages recorded each day at each station. This way of presenting the data resulted in 2 exceedances of the 340 ppb limit, one in June at Union Street and one in March at Kinsmen.

There were 4 instances when the “clock-hour” 1-hour average of the SO₂ provincial air quality standard (250 ppb) was exceeded (once at the New Sudbury station, twice at Kinsmen (same event), and once at the Union station); however, this limit comes into force in 2017, as stated in the Site Specific Standard Approval.

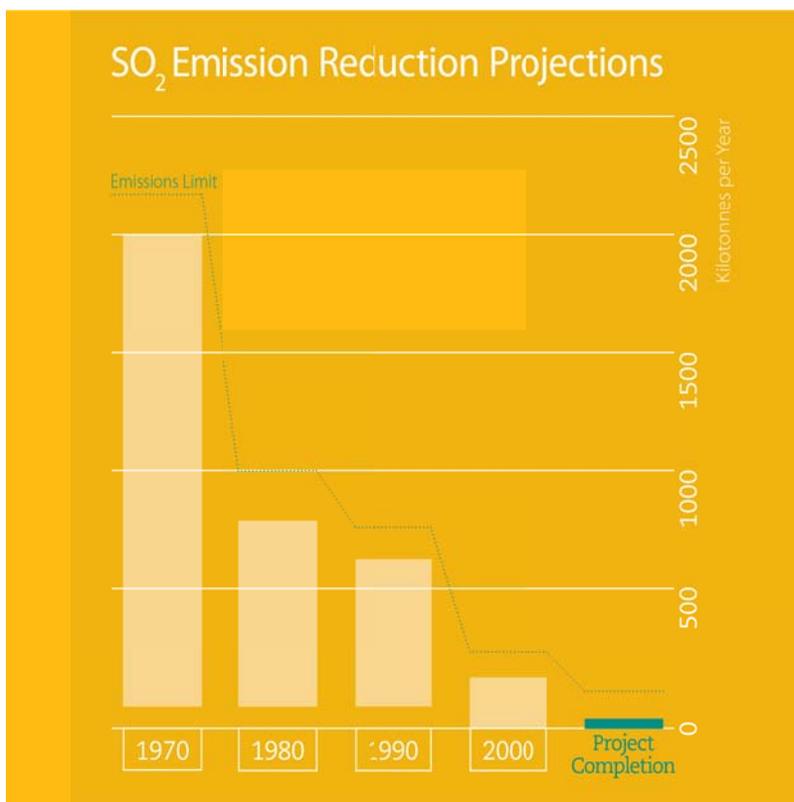
The chart below provides a summary of the 2013 hourly (clock) SO₂ values.



Annual Arithmetic Mean SO₂ Concentration (ppb)
by Station - January to December 2013



Vale has historically met reduced sulphur dioxide emission targets for total SO₂ emitted from the Smelter, and has achieved significant SO₂ reductions over the years. A graph of these reductions is provided below.



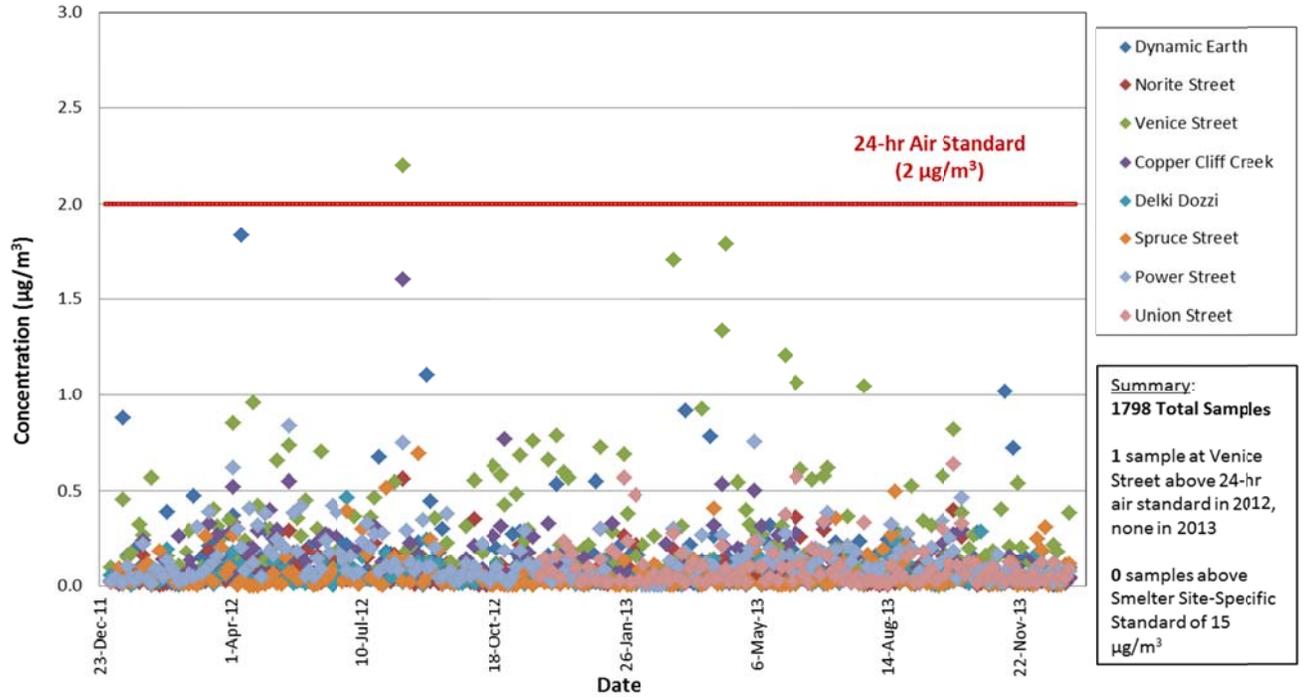
Nickel / Cobalt

Vale's particulate sampling network of 8 monitoring stations operate on concurrent 3-day or 6-day sampling schedules, with several stations operating multiple monitors to collect different size fractions of particulate matter on filters over a 24-hour period. The filters are sent away to a lab for metals analysis. The operation of the monitoring network, lab analyses and reporting of the results is done by an independent consultant. Quarterly reports are posted on the Vale website referenced above as they become available (lag time for filter and data analysis). A map showing the location of the monitoring stations is provided below.

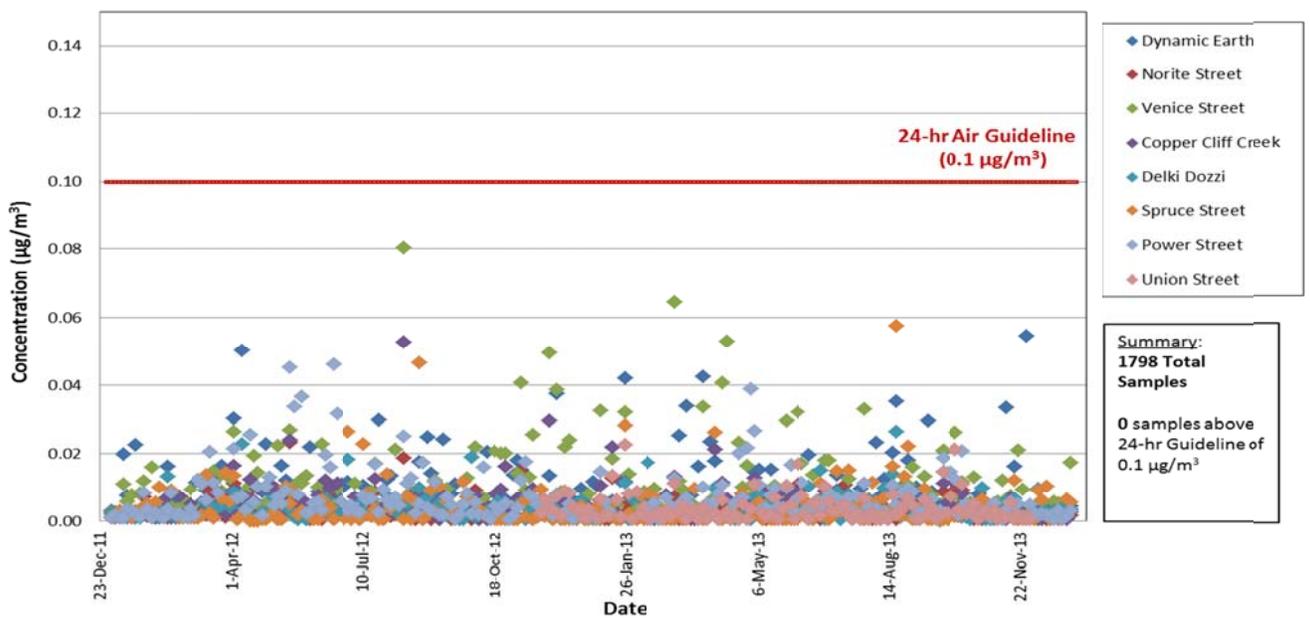


There were no exceedances of the air quality standards for any of the metals measured in 2013, including nickel and cobalt. This is the first year to achieve this record, and is attributed to a number of projects undertaken over the past several years - road paving, road relocation, road cleaning equipment, stockpile relocation, trackout controls, and improved material handling practices in all areas of the Smelter operations. Nickel and cobalt monitoring data for 2012 and 2013 for the 8 air quality monitoring stations are presented in the two graphs below, which indicate that concentrations were measured to be well below the limits for the majority of samples collected in 2012 and 2013. The most recent monitoring results for these and other metals measured at these stations are available on the Vale website.

Nickel Concentrations Measured at the Community Monitoring Stations 2012 and 2013



Cobalt Concentrations Measured at the Community Monitoring Stations 2012 and 2013

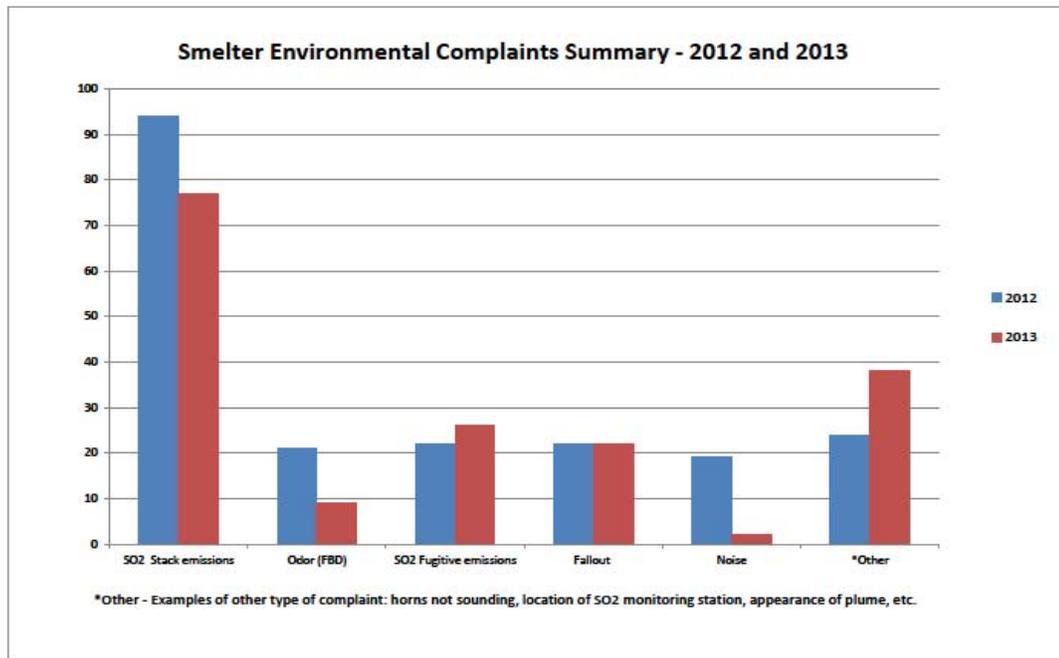


4.0 Environmental Community Concerns / Complaints

The Environmental Compliance Approval and Nickel Site-Specific Standard Approvals require Vale to make a telephone number available to the public to register environmental complaints. All complaints must be documented and followed up. Vale has had telephone numbers and a process to address community concerns for many years. For the Smelter specifically, there is a telephone number, **705-682-8283**, that is answered by a Smelter employee 24 hours per day, 7 days per week to receive and address concerns. The procedure for addressing complaints was presented in the 2012 report. The Smelter's Environmental Compliance Approval requires Vale to submit a quarterly summary report to the Ministry of Environment, detailing all of the complaints received in the quarter and the follow-up on each complaint. Four reports were submitted to the MOE with this information for 2013.

There were 331 complaints received in 2013, compared to 311 in 2012. The complaints have been sorted by type or source of complaint in the graph provided below. Excluded from the chart are complaints that fell into the category of "unknown"; a category that represents complaints that, after investigation, could not be related to Vale's emissions, due to wind direction. There were 157 "unknown" complaints received and addressed in 2013, compared to 109 in 2012.

Of the 331 complaints received in 2013, it should also be noted that a total of 196 calls were related to one caller.



5.0 Action Plan Updates

As part of its submission for site-specific standards for nickel and sulphur dioxide, Vale submitted action plans to reduce its overall emissions and ground level concentrations in the community. These action plans became conditions and were appended to the site-specific standard approvals. Vale prepares a report to update the status of its action plans semi-annually, in March and September. The updates are posted on Vale's website at:

<http://www.vale.com/canada/EN/aboutvale/communities/health-safety-environment/our-environment/air-quality/sudbury-air-quality/environmental-monitoring-team/Pages/default.aspx>

6.0 Contact Info

For more information or to discuss this report, contact Frank Javor, Manager Environment Air, Vale Ontario Operations, at 705-682-6736, frank.javor@vale.com.