Industrial Minerals Association – North America

January 28, 2005

The Honorable Spencer Abraham
Secretary of Energy
U.S. Department of Energy
1000 Independence Avenue, NW
Washington, DC 20585

Dear Mr. Secretary:

The Industrial Minerals Association – North America (IMA-NA) is pleased to respond, on behalf of its member companies in the soda ash, borates and sodium silicates industries, to President Bush's challenge to help reduce intensity of greenhouse gas emissions over the next decade.

IMA-NA commends the President's ClimateVISION program to address the global climate issue through voluntary measures. We support this approach to achieve the environmental protection our nation requires without unacceptable damage to our national economy.

In response to the President's challenge, IMA-NA's soda ash, borates and sodium silicate company members[1] have set a goal to reduce overall greenhouse gas emissions from fuel combustion per ton of product by 4.2% between 2000 and 2012. The companies included in IMA-NA's membership represent - in percentage of U.S. total production - some 80% of soda ash, 100% of borates, and 60% of merchant sodium silicates.

The soda ash, borates and sodium silicate industries have a number of common elements in addition to their individual distinguishing characteristics. These common elements are:

- World class standards for product quality and environmental stewardship.
- Sufficient reserves to sustain domestic production and export markets for decades to come.
- Worldwide markets for products, yet tough competition from foreign producers particularly in developing countries, without comparable environmental standards. In greenhouse gas efficiency our U.S. industries are superior to those with which we compete.
- Dramatic reductions of emissions of greenhouse gases over the past 30 years.

[1] FMC Corporation, General Chemical Industrial Products, Inc. (including its Amherstburg, Ontario plant), PQ Corporation, Searles Valley Minerals, Solvay Chemicals, U.S. Borax

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- Use of our products by our downstream customers result in substantial further reductions in greenhouse gas emissions. Examples include: 1) fiberglass insulation material using borates and soda ash; 2) energy efficient glass for modern buildings; 3) catalytic cracking processes that use sodium silicates; and 4) ceramic tiles.
- For a substantial portion of our operations (soda ash), it has become cost-prohibitive to continue to use natural gas, despite the well-understood advantages of natural gas relative to carbon dioxide emissions. Were it not for concerted efforts to reduce emissions wherever possible, the conversion to coal would have resulted in substantially increased greenhouse emissions.

Description of Soda Ash, Borates and Sodium Silicates

Soda Ash

Soda ash, also known as sodium carbonate (Na_2CO_3), is an alkali chemical refined from the mineral trona or naturally occurring sodium carbonate-bearing brines (both referred to as natural soda ash), the mineral nahcolite (referred to as natural sodium bicarbonate, from which soda ash can be produced), or manufactured from one of several chemical processes (referred to as synthetic soda ash). Some five plants in the U.S. operate in the Green River Basin of Wyoming and Searles Dry Lake in California, where the two commercially viable deposits of natural soda ash are located. Together their reserves are adequate to supply the entire world for 1,300 years.

The U.S. sets the world's standard for soda ash quality, supply reliability and customer service. Additionally, U.S. producers are the acknowledged leaders in overall process efficiency. Importantly, the U.S. soda ash production utilizes a natural process, which is more environmentally friendly than the synthetic process in use in other parts of the world (e.g. China). Even among other "natural" soda ash operations elsewhere in the world, the Green River Basin and Searles Dry Lake deposits result in lower levels of impurities such as chlorides, fluorides, and sulfates. The sophisticated chemical processing in the U.S. produces a soda ash noted for its whiteness and purity.

Soda ash touches our lives everyday. Glass manufacturing is the largest application, including containers, fiberglass insulation, and flat glass for the housing, commercial building, and automotive industries. Soda ash also is used to clean the air and soften water. As environmental concerns have grown, demand has increased for the use of soda ash in the removal of sulfur dioxide and hydrochloric acid from stack gases. Chemical producers use soda ash as an intermediate to manufacture products that sweeten soft drinks (corn sweeteners), relieve physical discomfort (sodium bicarbonate) and improve foods and toiletries (phosphates). Household detergents and paper products are other common examples of readily identifiable products using soda ash.

To convert trona to soda ash a number of steps are required. First the raw ore from the mine is crushed and screened. The material is then fed to rotary calciners and heated. In this process, the trona decomposes to form crude soda ash, which is dissolved in water. The insoluble shales are separated from the solution by a combination of settling and filtration steps, and the resulting insoluble tailings are either taken back into the mine as backfill or disposed of on the surface in

an environmentally sound manner. The soda ash solution is treated to remove organic materials yielding a high-purity saturated solution of sodium carbonate.

Next, the solution is fed to crystallizers where water is evaporated and sodium carbonate monohydrate crystals are formed. The crystals are dewatered and washed using cyclones and centrifuges, and the solution is recycled to evaporator units for further recovery of soda ash. The monohydrate crystals are fed to rotary kilns where they are dried to finished soda ash. Finally, product is screened and sent to storage silos awaiting rail and truck loadout.

Borates

The U.S. borates industry consists of two companies, U.S. Borax and Searles Valley Minerals, Their boron deposits are located primarily in southern California. Together these companies supply more than one-half of the world's demand for refined borates.

Borates are naturally-occurring minerals containing boron, the fifth element on the Periodic Table. Trace amounts exist in rock, soil and water. Boron does not exist by itself in nature. Rather, boron combines with oxygen and other elements to form boric acid, or inorganic salts called borates. Despite the millions of tons of industrial borates mined, processed and distributed around the world every year, far larger quantities of boron are transferred around the planet by way of natural forces. Rain, volcanic activity, condensation and other atmospheric activities redistribute at least twice as much boron as all commercial practices combined.

Plants need borates to grow. People need borates, too, as an important part of a healthy diet and an essential component in many products necessary for an acceptable standard of living. Borates are an essential ingredient in an array of the products we use every day, including:

- insulation fiberglass, textile fiberglass and heat-resistant glass
- detergents, soaps and personal care products
- ceramic and enamel frits and glazes, ceramic tile bodies
- agricultural micronutrients
- wood treatments, polymer additives and pest control products

Sodium Silicates

Sodium silicates are produced by melting different weight ratios of high purity quartz sand and soda ash in a furnace. The product leaving the furnace is a highly viscous fluid, which is dissolved in water to produce "water glass" or soluble sodium silicate solutions. Silicates are used in a diverse portfolio of applications. They are used in the manufacture of laundry detergents, high-end fluidized cracking catalysts, complex silica gels for removal of impurities from foods and beverages and as a base for the manufacture of precipitated silica for tires, toothpaste and tennis shoes. The environmentally friendly nature of silicate makes it the perfect solution for on and off shore drilling fluid applications as well as for treatment of our municipal water distribution systems.

The Soda Ash, Borates and Sodium Silicates Industries and Greenhouse Gas Emissions

The carbon dioxide equivalent generated by our members' operations represents a very small portion of the total carbon dioxide equivalent emitted in the United States — approximately 0.17%.

Carbon dioxide is emitted from the production of our materials in two ways. First, to provide heat required in the production process, fossil fuels are combusted that generate CO_2. Coal is the primary fuel for soda ash for compelling economic reasons.

Secondly, CO_2 is produced as a result of the chemical process utilized in the processing of soda ash and sodium silicates. This inherent chemical process accounts for 12% of the CO_2 emitted from soda ash, borates, and sodium silicate production. Because of the raw materials required to make these products, the CO_2 emissions cannot be reduced except by limiting production.

The soda ash, borates and sodium silicate industries have reduced their greenhouse gas intensity significantly over the past 30 years, driven by the economic requirement to reduce energy costs. The major sources of greenhouse gas generation in our industries are the fossil fuels consumed to generate the heat and electricity required in our processes. Improvements in instrumentation and controls have allowed all of our plants to improve efficiencies. In the 1970s and 1980s synthetic soda ash plants were replaced by much more energy-efficient - and less greenhouse gas-intense - natural soda ash facilities. Since the mid 1970s, programs have been implemented to reduce fossil fuel usage on the combustion sources by improving air/fuel ratio control. Waste heat has been utilized to preheat combustion air, and also to generate steam. State-of-the-art burners are used to increase heat transfer and improve fuel efficiencies. Many less efficient operating units have been shut down and the business transferred to more fuel-efficient units, which generate less CO_2/ton of product. Electric usage has been reduced by switching to high-efficiency motors and changing to higher efficiency plant lighting.

The IMA-NA program to reduce greenhouse gas emissions in soda ash, borate, and sodium silicates has been directed by its Soda Ash and Borates Sections, which are comprised of the leaders of the companies that produce the affected materials, and a task force established by the Sections to implement their policies. The goals described in this paper are the result of this year-long effort.

The IMA-NA Goal

As described above, the IMA-NA goal focuses on reducing the greenhouse gas intensity of combustion-related emissions, and must be addressed through energy efficiency improvements and other means.

The elements of the IMA-NA plan are as follows:

1. *Emissions Intensity Goal*— IMA-NA members will, on an aggregate basis, reduce greenhouse gas emissions from fuel combustion per ton of product by 4.2% between

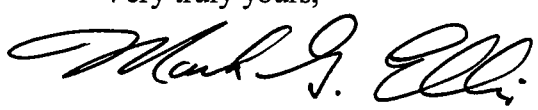
2000 and 2012. A variety of strategies are being employed to achieve this goal, including (but not limited to) improved energy efficiency through physical modifications to plant operations; use of alternative fuels; carbon sinks; sequestration; and offsets. Because this is an aggregate goal, individual company intensity goals vary depending on their unique circumstances.

2. *Emissions Protocol*—IMA-NA has developed a protocol for quantifying greenhouse gas emissions and emission reductions from its member company facilities (see attached). This protocol will be used to measure progress in pursuing the numerical intensity goal.
3. *Reporting*—IMA-NA has compiled the attached initial report on aggregate industry trends in greenhouse gas intensity (emissions per unit of production). IMA-NA will furnish GHG intensity reports to DOE every second year hereafter.
4. *Education and Research*—IMA-NA will provide support and education for its members in their efforts to achieve program goals, through meetings, research, publications, and other methods.

IMA-NA will seek opportunities to partner with the government and other entities to achieve further reductions in greenhouse gas intensity. We encourage the Administration to do all that it can to support the domestic soda ash, borates and sodium silicates industries, not only because they contribute significantly to the U.S. economy, but also because they are more protective of the environment than their competitors outside the U.S. Shifts in production to the U.S. from offshore producers of soda ash, borates and sodium silicates would decrease the world's production of greenhouse gases. This is particularly true given the environmental benefits that accrue from use of our products.

IMA-NA and its members look forward to working with the Department of Energy and the Council on Environmental Quality to meet these voluntary goals.

Very truly yours,



Mark G. Ellis, President
Industrial Minerals Association – North America

cc: The Honorable James L. Connaughton, Chairman
U.S. Council on Environmental Quality
Phillip Cooney, Chief of Staff
U.S. Council on Environmental Quality
Larisa Dobriansky, Deputy Assistant Secretary
U.S. Department of Energy