EASTERN KERN AIR POLLUTION CONTROL DISTRICT

DESERT BREEZE

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SunSelect Greenhouse—Above and Beyond Sustainability

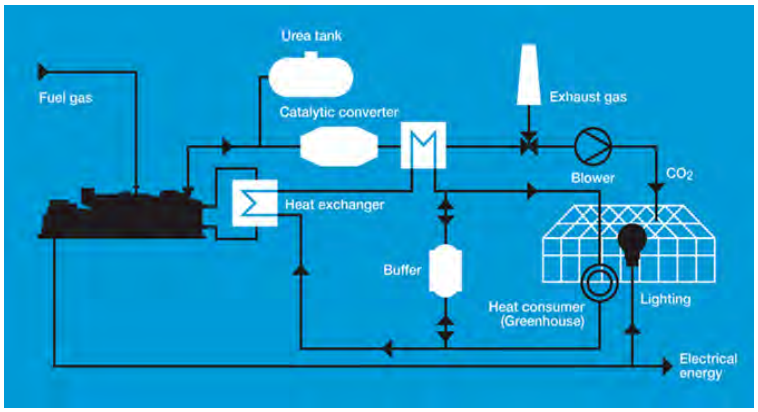
SunSelect is a privately owned agricultural company that specializes in growing greenhouse crops. SunSelect originally operates their greenhouse facilities in Canada. However, in 2014, SunSelect built a 64-acre high tech, state-of the-art greenhouse facility in Tehachapi, California. Along with cocktail and traditional tomatoes-on-the-vine, SunSelect produces sweet bell peppers year-round. The ability to grow bell peppers year-round makes SunSelect the only large scale greenhouse grower in California to produce bell peppers in the winter.

SunSelect uses sustainable growing methods to produce fresh, healthy vegetables and innovative technology for growth of plants in "tiny" blocks of coconut husk waste that are nourished by drip irrigation. There is no direct application of manures, no risk in groundwater contamination, and smaller quantities of water needed for the facility. Additionally, the controlled environment of SunSelect greenhouses provides ideal conditions for growing perfect produce 24 hours a day/365 days a year without herbicides, pesticides or use of genetically modified pollen.

Inside the fully sealed greenhouse, SunSelect employed the latest technology to assure an optimal growing environment where sustainable practices are undertaken. Some practices include:

1. **Water recycling** - plants are fed and watered by a recycling drip system;
2. **Pollination** - achieved by hives of bumblebees which are attached to the end of each row of plants; and
3. **Automated heating and ventilation system and carbon dioxide (CO_2) dosing system** - to optimize plant growth and crop yield.

The figure to the right shows how SunSelect accomplishes their automated heating and CO_2 dosing for their greenhouse. They have generators driven by natural gas fired engines with combined heat and power units. They provide electrical energy needed for the greenhouse and CO_2 from combustion which provides what the plants need for their growth.



In conclusion, the greenhouse like SunSelect accomplished many environmental concerns. Only a small quantity of water is needed by utilizing recycled water with drip irrigation system. Close system from their greenhouse emits little or no dust which in turn creates better air quality. Water contamination is minimized due to little or no use of herbicides and pesticides. Therefore, SunSelect is the future of eco-friendly and sustainable greenhouses.

By: Wunna Aung

Pollutant of the Quarter: Chromium

Chromium is a naturally occurring element that can be found in soil, water, and living organisms, and is most often found in the trivalent (Cr (III)) and hexavalent (Cr (VI)) oxidation states. Cr (III) is healthy for human consumption in small quantities, similar to iron or magnesium. Cr (VI), however, is recognized as a carcinogen for both the respiratory and digestive tracts. In the Cr (VI) state Chromium is combined with oxygen to form compounds such as potassium chromate or lead chromate (containing the hexavalent form of chromium). Cr (VI) compounds are used as a pigment (e.g. lead chromate) and corrosion inhibitor for coatings (e.g. strontium chromate) and as a wood preservative (e.g. magnesium chromate). Also, the red color of rubies is from a trace amount of chromium. Chromium metal is of high value for its high corrosion resistance and hardness. A major development was the discovery that steel could be made highly resistant to corrosion and discoloration by adding metallic chromium to form stainless steel. Stainless steel and chrome plating (electroplating with chromium) together comprise 85% of the commercial use.

Exposure to Cr (VI) most often occurs in industrial environments, particularly electroplating, "hot work" on metals containing Chromium, spray coating operations, textile or leather goods production, and in the burning of coal. Cr (VI) has been linked to nasal, sinus, and lung irritation and is considered carcinogenic. However, after plating and alloying with other metals, chromium form strong bonds, and the Cr (VI) ion is not available.

Eastern Kern Air Pollution Control District (District) has 3 rules related to control of chromium emissions: Rule 429 (Decorative and Hard Chrome Plating and Chromic Acid Anodizing Facilities), Rule 429.1 (Cooling Towers), and Rule 423 (National Emission Standard for Hazardous Air Pollutants (NESHAPS) Source Categories). Rule 429 requires facilities that use chrome plating or chromic acid anodizing tanks to have either an anti-mist additive or an emissions collection system that reduces chromium emissions by at least 95%. Rule 429.1 prevents the addition of water treatment chemicals containing chromate to cooling towers, and limits hexavalent chromium concentrations in the circulating water. District Rule 423 is used to enforce the NESHAP for Chromium Electroplating and Chromium Anodizing Tanks (40 CFR 63 Subpart N) and Chromium Compounds from Chemical Manufacturing Area Sources (40 CFR 63 Subpart NNNNNN).

There are very few sources of Cr (VI) emitters in the District. Many years ago several paints contained lead chromate and strontium chromate compounds; however, after the dangerous nature of Cr (VI) compounds were publicized, most of these compounds were replaced or eliminated. All facilities that burn coal have dust collection system that control 99.99% of the exhaust emissions. Additionally, there are no chrome plating facilities within the District jurisdiction. The stainless steel knives, knobs and bumpers are safe to have in and around your homes. And your rubies are safe to wear.

By: Samuel Johnson

US Borax Facility

U.S. Borax Boron Operations is a member of the Rio Tinto Minerals group. As the name indicates, US Borax mines boron materials that include sodium borate, sodium tetraborate, or disodium tetraborate. However, any discussion of Rio Tinto Minerals (RTM) Boron Operations begins with safety:

1. People are the most important aspect of Rio Tinto's business.
2. A safe, healthy and engaged workforce is required to expand and sustain operations.
3. Globally, RTM employees reduced the injury frequency rate by 34% over the previous five years.
4. Improving critical controls every day, during 2016, leaders checked critical controls on 1.3 million occasions across the business – resulting in safer work conditions.

A little history: Pioneers exploring the resources of the American West, in 1881, discovered borates in Death Valley, one of the driest and hottest places on Earth. From 1883 to 1889, the famous 20 Mule Teams pulled massive wagons hauling borax from Death Valley to the railhead near Mojave, a grueling 165 mile, ten-day trip through high temperatures, deep sands and steep grades. Working in these unforgiving conditions required careful consideration of water, resources and people. In six years, the team hauled more than 15 million pounds of borax. No team member or mule was ever lost. U.S. Borax donated land from their Death Valley site that officially became Death Valley National Park in 1994.

The US Borax facility today (established in the late 1920's) is not at the same location as the Death Valley site, but (at over 750-ft deep and 1¾-miles wide) is currently the largest open-pit mines in California. RTM Boron Operations has implemented many innovations to remain "Environmentally Friendly." A couple of innovations dealing with overburden (piles of waste soil created as part of the mining process) are:

- Overburden is reclaimed not to be a waste material. Ongoing research helps determine the right mix of native seeds for reclamation of the slopes. Overburden slope reclamation began in 1995 and continues today.
- The Boron mine in California is developing an innovative approach to disposing of overburden, which will lead to a significant reduction of diesel fuel use.

US Borax started with the 20 Mule Team Borax in 1891. Borax maintains its position as the world leader in borate chemistry and borate technology through its advanced mining facilities, refineries, research, and development laboratories. Just a few of the modern products that depend on borates are: glass (TV, cell phones, Pyrex, and fiberglass insulation), porcelain enamel, ceramics, detergents (to enhance whitening), aircrafts (structural sections), automobiles (antifreeze, brake fluid, etc.), cosmetics, medicines, building materials (providing insect and rot protection), flame retardants, electronics (in the manufacture of semi-conductors, transistors, and etc.), and agriculture (as a soil micronutrient).

For additional information on US Borax, be sure to visit the Twenty Mule Team Museum when you're in Boron. Perhaps on your next trip to Las Vegas. The Borax Visitor Center is open seven days a week from 9 a.m. to 5 p.m. (last entry at 4:45 p.m.), excluding major holidays and weather permitting. Admission is free, but all donations support local community organizations through the Borax Visitor Center Foundation. Parking is accessible to recreational vehicles. 26962 Twenty Mule Team Road, Boron, **visitor.center@riotinto.com**,**(760)762-7588.**

By: Brenton Smith

Meet our Newest Board Member

The District would like to welcome our newest board director, Donald L. Parris. Donald was born and raised in the Antelope Valley where he graduated from Palmdale High School in 1968. He then joined The U.S. Army, graduated from Army helicopter training, and flew helicopters in Vietnam. When he came home, Donald went to work for the Ridgecrest Police Department. Eventually, Donald went to Imperial County Sheriffs to fly helicopters and fix wing aircraft. There he became their Chief Pilot. Donald spent 28 years in Law Enforcement. He is now the administrator owner of a Private Christian school in California City. Additionally, he is Deacon at the First Baptist Church in California City, and a Council Member for California City.

Board of Directors

Ed Grimes, Chair (Mayor, Tehachapi)
Don Parris, Vice Chair (Councilman, California City)
Peggy Breeden (Mayor, Ridgecrest)
Mick Gleason (KC 1st District Supervisor)
Zack Scrivner (KC 2nd District Supervisor)

Board of Directors usually meet once every two months starting in January at the Tehachapi Police Department Community Room.

Air Pollution Control Officer

Glen E. Stephens, P.E.

Hearing Board Members

William Deaver
Doris Lora
Dr. Wallace Kleck
Chris Ellis
Charles Arbaut

For news updates and other information, please visit the Eastern Kern APCD website at www.kernair.org

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