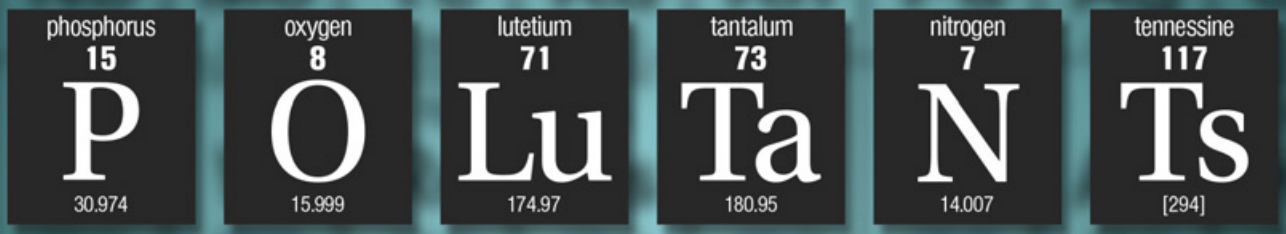
the Rain events

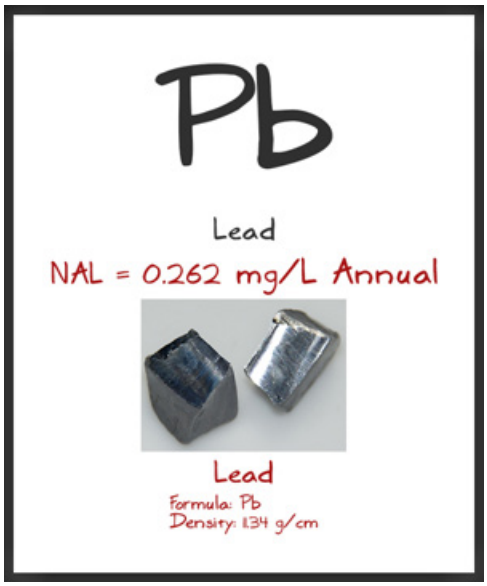
October 2018



Part 12 of a 12-part **exclusive series** on understanding storm water pollutants

We could call it the "assassin" pollutant. This very common element has had a hand in the demise of Ludwig von Beethoven, the Italian painter Michelangelo Caravaggio, Pope Clement II, and possibly even the Roman Empire itself. Lead, because of its relative softness and low melting point, has been widely used since antiquity – even as a sweetener in the form of lead acetate, which was popular during the Roman Empire. In this last edition of our Understanding Pollutants series, we're going to take a look at this widely used and dangerous metal.

Lead is a heavy metal that is denser than most common materials. It is soft and malleable, and has a relatively low melting point. In its untarnished state, lead is a silvery metal with a hint of blue, but quickly tarnishes to a familiar dull gray color. These properties, along with its relative abundance and low cost, resulted in a widespread use in plumbing, bullets and shot, weights, metal alloys, paint, and even gasoline.



Lead is a poisonous metal with no known biological role, but nonetheless is the third most prevalent heavy metal in the human body, behind iron and zinc. Unlike other elements which are easily excreted from the body, lead bioaccumulates in soft tissues and bones, and is particularly dangerous to children.

So on an industrial site, where would lead be coming from? Well, an examination of the public storm water data on SMARTs reveals that the SIC code group with the highest numbers is 5093 and 5015 – scrap and waste materials, and wrecking yards, respectively. Makes sense. But other sources of lead could be facilities that manufacture or handle batteries, marine and boat yards, and metal foundries. Facilities listed in Table 1 of the IGP that are required to sample for lead include fertilizer and pesticide facilities (SIC 287X), hazardous waste facilities (SIC 4953), water transportation (SIC 44XX), dismantling and wrecking yards (SIC 5015), and scrap and waste material facilities (SIC 5093). It's pretty obvious that lead could be coming from scrap or wrecking activities, but fertilizer and pesticides? Well, some of the materials that are used to make the fertilizer could be contaminated with lead – like the steel mill flue dust used to supply iron in some fertilizers. Lead is also used in marine operations and watercraft – like lead ballast weights, or red lead and white lead marine primer. Another potential source of lead to keep in mind are mining facilities, or industries that use mining byproducts such as "chat."

OK, so if a facility has an issue with high lead numbers, what can be done to bring the results back under the NALs?

As always, the best way to keep lead out of storm water is to, well, keep it out of storm water. This is source control – preventing exposure, keeping lead-containing materials under cover, and containing any contaminated dust. Also, don't forget your good housekeeping! But most people who have high lead numbers are likely beyond the help of source control and good housekeeping. Maybe there are high background levels of lead in the soil, or leftover from past industrial activity. So, what are the options for removing lead from storm water runoff? Fortunately, lead tends to precipitate out of solution, so dissolved lead in storm water isn't very common. A couple effective ways

to remove lead from storm water runoff include using active or passive treatment systems that have been specifically engineered to remove heavy metals, and bioswales planted with lead-tolerant hyperaccumulator varieties. Because lead is typically in particulate form, sediment control BMPs like compost filter socks can also be effective, especially for facilities that aren't fighting particularly high numbers.

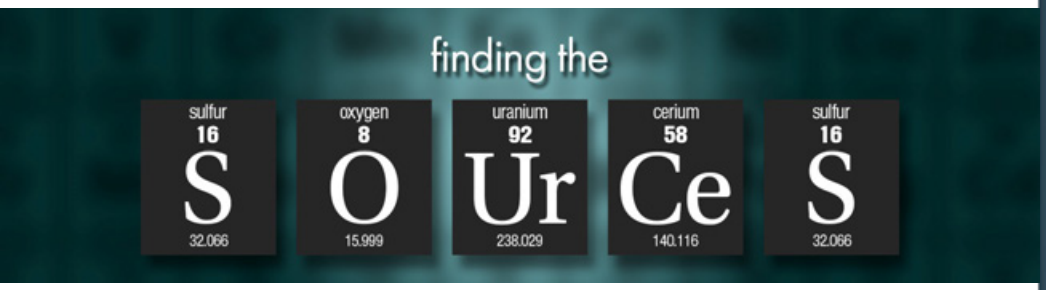
As you've probably noticed, the Annual NAL for lead is extremely low at only 0.262 mg/L. For such a common element, it may seem impossibly low. But don't worry – during the 2017-2018 reporting year, there were only 52 samples collected in the State of California that exceeded the NAL. And these are just *samples*, not annual averages. So relax – a good, three-tiered BMP approach (source control, good housekeeping, and treatment) will probably keep you out of trouble.

Sources:
1. Wikipedia, s.v., "Lead," *Wikipedia The Free Encyclopedia*, last modified October 29, 2018, https://en.wikipedia.org/w/index.php?title=Lead&oldid=866349350

Hyperaccumulators. What are they?

We've all heard of bioswales and bioaccumulation – using plants and microbes to remove or reduce pollutants in an environmentally friendly way. But hyperaccumulators take bioswales to the next level. There are specific species of plants that have the ability to grow in soils with very high concentrations of heavy metals, and absorb extremely large amounts of metals. Compared to non-hyperaccumulating species, hyperaccumulator roots extract metals from the soil at a higher rate, transfer it more quickly to their shots, and store large amounts in their leaves and roots. Some of these species are so efficient at extracting metals that they can be used in *phytomining* – mining metals from soil by harvesting the hyperaccumulating plants. A list of hyperaccumulators can be found here:

https://en.wikipedia.org/wiki/List_of_hyperaccumulators



We've talked about a few sources of lead in our main article. Here's a few more potential sources to keep in mind:

- Ammunition and bullet manufacturing
- Weights and ballast
- In metal alloys, such as in brass or bronze
- Architectural lead, such as in sound proofing sheets
- Lead-acid batteries
- Shielding applications to protect from radiation
- Solder for electronics
- As a component in PVC coatings (electrical cords, etc)
- Lead glass

Have questions about the Industrial General Permit?
Give us a call at (209) 334-5363, ext. 114

"To Do List" for November:

- Perform the November monthly inspection
- Get ready for the rain season! If you haven't yet done so, now's the time to check your sample kit and make sure you have everything you need.

IGP Amendments

We're almost there. The State Water Resources Control Board will be considering adoption of the proposed amendments to the Industrial General Permit at the regularly scheduled Board meeting on November 6th.

If you haven't been keeping up with the proposed amendments, you might want to do so. These amendments are game changers – there are significant changes to the TMDL requirements, as well as Attachment I, compliance options, and incentives. The proposed amendments can be downloaded from the Water Board's website, at this address:

https://www.waterboards.ca.gov/water_issues/programs/stormwater/tmdl_igp.html

There is also a download link on this page for the comments submitted during the public comment period, and you can read the Water Board's responses to those comments.

Here are a couple podcasts to get you up to speed on the proposed amendments:

LISTEN SWPPP RADIO
http://swpppradio.org/listen.php?ID=23

LISTEN SWPPP RADIO
http://swpppradio.org/listen.php?ID=24

Please contact us if you have any questions …

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Storm Water Contest...

Each month, we invite our readers to participate in a contest to test their knowledge of the Industrial General Permit and their storm water compliance program. We enter all submittals to our monthly newsletter question into a drawing, and one person is selected at random to receive a $25 gift card. Last month's question was:

Do all airports need to include ammonia as a Table 1 sampling parameter?

Congrats, **Stuart Peters,** you won! **No, not all airports need to include ammonia as a Table 1 sampling parameter.** According to the footnote on Table 1, only airports (SIC 4512-4581) where a single discharger or a combination of permitted facilities use more than 100,000 gallons of glycol-based deicing chemicals and/or 100 tons or more of urea on an average annual basis are required to monitorfor BOD, COD, and NH_3.

This Month's Contest Question:

What storm water topics do you want us to cover next?

Submit your answers by **Friday, November 9th**. Email your answer to jteravskis@wgr-sw.com. One winner will be selected by a random drawing to receive a **Honeybaked Ham Oven-Roasted Turkey Breast!** Just in time for Thanksgiving.