Notes for discussion at the TURA Administrative Council meeting on September 23, 2009.

As discussed at the TURA Administrative Council meeting of July 29, 2009, MassDEP has concerns about delisting specific iron compounds from the TURA List. These compounds include:

- ferric chloride
- ferric sulfate
- ferrous chloride
- ferrous sulfate

The following is a list of MassDEP's concerns:

1. Limited toxicity data exists for these iron salts. Delisting chemicals for which we have little toxicity data is not a prudent public health protection decision. For example:
    a. Testing of these compounds for developmental, reproductive and neurological health effects is weak or non-existent
    b. Both positive and negative mutagenicity test results have been found for these iron compounds. There is no data on potential carcinogenicity.

2. Cassarett & Doull's textbook, *Toxicology: The Basic Science of Poisons.* 6th Edition (2001) provides a summary on the toxicity of iron, which is outlined below:

    a. Acute Toxicity: iron compounds are moderately toxic. Ingestion can induce vomiting and ulceration of the gastrointestinal tract. Late effects may include kidney failure and cirrhosis of the liver.

    b. Chronic Toxicity: Chronic iron toxicity is more common than acute toxicity. Some adults develop idiopathic hemochromotosis due to abnormal absorption of iron from the intestinal tract. Iron overload may also be due to excess dietary iron intake. In addition, iron overload may occur from regular requirements for blood transfusions for treating anemia. These adults are more sensitive to iron exposure.

    Excess iron will concentrate in the liver, pancreas and endocrine organs, and heart. Clinical impacts may include disturbances in liver function, diabetes mellitus, endocrine disturbances and cardiovascular effects. At the cell level, increased lipid peroxidation occurs with membrane damage to mitochondria, microsomes and other cellular organelles. There is epidemiologic evidence for a relationship between iron levels and cardiovascular disease.

    Inhalation of iron oxide fumes or dust by workers in metal industries may result in deposition of iron particles in lungs, producing an x-ray resembling silicosis. These effects are seen in hematite miners, iron and steel workers and arc welders.

3. The occupational limits for the iron compounds are relatively low and they represent a greater potential health risk than some other chemicals that remain on the TURA list.

4. Acute toxicity values for the iron compounds are relatively low, meaning greater toxicity than some chemicals that remain on the TURA list.

Based on the above, MassDEP does not support delisting the above iron compounds, but would support designating them as lower hazard chemicals.