

## 5. PRODUCTION, IMPORT/EXPORT, USE, AND DISPOSAL

### 5.1 PRODUCTION

Wood creosote, coal tar creosote, coal tar, and coal tar pitch differ from each other in composition. Wood creosotes (CAS Registry number 8021-39-4) are derived from beechwood (referred to herein as beechwood creosote) and the resin from leaves of the creosote bush (*Larrea*, referred to herein as creosote bush resin). Beechwood creosote is not commercially produced in the United States (HSDB 2000).

Coal tars are by-products of the carbonization of coal to produce coke and/or natural gas. By comparison, coal tar creosotes are distillation products of coal tar. Unlike the coal tars and coal tar creosotes, coal tar pitch is a residue produced during the distillation of coal tar. Coal tar pitch volatiles are compounds given off by coal tar pitch when it is heated, and thus vary with the composition of the coal tar pitch (see Table 4-7). The volatile component of coal tar has not been addressed separately from coal tar pitch in this section.

Because coal tar is a by-product of steel manufacturing, domestic production of coal tar products may vary depending on demand for steel (USITC 1987). Coal tar production in the United States was 168.6 million gallons in 1986 (USITC 1987) and 188.5 million gallons in 1987 (USITC 1988). In 1992,  $7.03 \times 10^8$  kg ( $1.55 \times 10^9$  pounds) of crude coal tar was produced (USITC 1994). Creosote has been produced commercially in the United States since 1917 (IARC 1985). Creosote production falls into two categories: distillate (100% creosote), and creosote in coal tar solution. Distillate production in 1986 was 46.8 million gallons; creosote in coal tar solution was 31.6 million gallons (USITC 1987). Distillate production in 1987 was 47.3 million gallons. Production of creosote in coal tar solution in 1987 was not disclosed, but solution sales in 1987 were 34.3 million gallons (USITC 1988). Distillate production in 1992 was  $2.41 \times 10^8$  kg ( $5.32 \times 10^8$  pounds); creosote in coal tar solution was  $1.10 \times 10^8$  kg ( $2.43 \times 10^9$  pounds) (USITC 1994). The U.S. International Trade Commission classifies pitch of tar as hard (melting point 161 EF), medium (melting point 110–160 EF), or soft (melting point 80–109 EF) (USITC 1994). Production of hard pitch in 1987 was  $4.93 \times 10^5$  tons. Soft pitch production data for 1987 were not disclosed, but  $6.52 \times 10^5$  tons were sold (USITC 1988). Production of hard pitch was  $6.08 \times 10^8$  kg ( $1.34 \times 10^9$  pounds) in 1992. Production and sales figures for medium and soft pitch were not disclosed for 1992 (USITC 1994).

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Table 5-1 lists the number of facilities in each state that manufacture or process coal tar creosote, the intended use, and the range of maximum amounts of creosote that are stored on site. The data listed in Table 5-1 are derived from the Toxics Release Inventory (TRI) (TRI99 2001). Only certain types of facilities are legally required to report; therefore, this is not an exhaustive list.

**5.2 IMPORT/EXPORT**

Available figures on imports and exports (NTDB 1994) are based on millions of gallons of all forms of creosote. Figures from the period 1984–1987 show fluctuations in the range of 1–10 million gallons of creosote products in both import and export levels. Recent data pertaining to the import or export of creosote (NTDB 1995) are presented in Table 5-2. The categories used by the National Trade Data Bank do not directly correspond to the four categories described in Section 5.1.

**5.3 USE**

Coal tar creosote has been used as a wood preservative pesticide in the United States for over 100 years. Wood preservation accounts for over 97% of current coal tar creosote production (Santodonato et al. 1985). Coal tar creosote is applied to wood by commercial pressure treatment or by home and farm dipping or brushing, although this latter use is not significant since creosote now has restricted use as a wood preservative pesticide (EPA 1986b). Coal tar creosote is a wood preservative and water-proofing agent for log homes, railroad ties, telephone poles, marine pilings, and fence posts. In addition, coal tar creosote prevents animal and vegetable growth on concrete marine pilings, and is a component of roofing pitch, fuel oil, and lamp black, and a lubricant for die molds (Cammer 1982; HSDB 2000). Other uses include animal and bird repellent, insecticide, animal dip, fungicide, and a pharmaceutical agent for the treatment of psoriasis (IARC 1985). Coal tar is registered as a pesticide active ingredient with the U.S. EPA and in 1998 was being evaluated for re-registration (HSDB 2000). The leaves of the creosote bush are ground to produce an herbal nutritional supplement for use as an antioxidant or free radical scavenger to retard aging and to treat a variety of skin conditions including acne. The supplement is claimed, in nonscientific publications, to have antiamebic, antifungal, and antiviral properties. Suggested uses include oral applications for colds, influenza, diarrhea, urinary tract infections, and topical applications for dandruff (Katz and Saibil 1990).

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**Table 5-1. Facilities that Produce, Process, or Use Coal Tar Creosote**

State <sup>a</sup>	Number of facilities	Minimum amount on site in pounds <sup>b</sup>	Maximum amount on site in pounds <sup>b</sup>	Activities and uses <sup>c</sup>
AL	7	10,000	9,999,999	1, 4, 9
AR	3	10,000	9,999,999	1, 3, 8, 9, 13
AZ	1	10,000	99,999	9
CA	4	100	999,999	8, 9, 13
CO	2	1,000	9,999,999	2, 4, 9
CT	1	100,000	999,999	9
FL	1	100,000	999,999	9
GA	2	100,000	999,999	2, 4, 8, 9, 12
ID	1	10,000	99,999	13
IL	4	100,000	49,999,999	1, 4, 9
IN	3	100,000	9,999,999	1, 3, 9
KY	4	100,000	9,999,999	8, 9, 13
LA	4	100,000	9,999,999	9
MI	1	1,000,000	9,999,999	8
MO	1	1,000,000	9,999,999	9
MS	7	10,000	49,999,999	2, 3, 9
NC	1	1,000	9,999	13
NE	1	10,000	99,999	13
NJ	2	1,000	999,999	9, 13
NY	1	100,000	999,999	2, 3, 4, 9
OH	3	1,000	49,999,999	1, 4, 13
OK	2	1,000	999,999	9, 13
OR	5	1,000	9,999,999	1, 6, 8, 9, 13
PA	5	100,000	49,999,999	1, 2, 4, 8, 9
SC	2	100,000	9,999,999	9, 13
SD	1	10,000	99,999	9
TN	1	10,000	99,999	9, 10
TX	5	10,000	9,999,999	9, 12, 13

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**Table 5-1. Facilities that Produce, Process, or Use Coal Tar Creosote  
(continued)**

State <sup>a</sup>	Number of facilities	Minimum amount on site in pounds <sup>b</sup>	Maximum amount on site in pounds <sup>b</sup>	Activities and uses <sup>c</sup>
UT	3	1,000	9,999,999	1, 4, 13
VA	3	100,000	9,999,999	8, 9
WA	1	100,000	999,999	12
WI	3	1,000	999,999	9
WV	5	100	49,999,999	1, 3, 4, 8, 9, 12

Source: TRI99 2001

<sup>a</sup>Post office state abbreviations used<sup>b</sup>Amounts on site reported by facilities in each state<sup>c</sup>Activities/Uses:

- |                          |                          |                             |
|--------------------------|--------------------------|-----------------------------|
| 1. Produce               | 6. Impurity              | 10. Repackaging             |
| 2. Import                | 7. Reactant              | 11. Chemical Processing Aid |
| 3. Onsite use/processing | 8. Formulation Component | 12. Manufacturing Aid       |
| 4. Sale/Distribution     | 9. Article Component     | 13. Ancillary/Other Uses    |
| 5. Byproduct             |                          |                             |

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**Table 5-2. Import/Export Volumes for Creosote**

Tariff Category	Imports/Exports	1991	1992	1993	1994	1995
Creosote oils	Exports (1,000 kg)	3,978	8,027	9,158	14,900	6,838
	Imports (1,000 L)	NR	17,584	22,674	17,994	9,466
Other oils and products of coal tar distillation	Exports (1,000 kg)	10,842	0	0	0	0
	Imports (1,000 L)	NR	10,690	40,475	219,424	12,643
Pitch from coal and other mineral tars	Exports (1,000 kg)	39,592	76,586	91,659	103,034	43,740
	Imports (1,000 L)	NR	6,226	115,688	77,791	50,315

Source: National Trade Data Bank (NTDB 1995)

NR = not reported

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Beechwood creosote and its compounds calcium creosotate, creosote carbonate, and creosote valerate were used in the past as antiseptics and expectorants (Merck 1989). Treatments for leprosy (Samson and Limkako 1923), pneumonia (McKinlay 1933), and tuberculosis (Fellows 1939a) also involved ingestion of beechwood creosote. Beechwood creosote is rarely used in the United States for medicinal purposes today.

The major use of coal tar pitch is as the binder for aluminum smelting electrodes. Pitch is also used in roofing, surface coatings, and for pitch coke production. Pipe-coating enamels made from pitch are used to protect buried oil, gas, and water pipes from corrosion (IARC 1985).

#### 5.4 DISPOSAL

According to the TRI, 616,938 pounds of coal tar creosote were transferred off-site from facilities that use or process coal tar creosote, presumably for treatment and disposal (TRI99 2001). Treatment of creosote sludge generated from coal tar creosote production includes fixing, solidifying, and covering with clay. In the past, settling lagoons were used in treatment. However, they are no longer being used, and those which were used are now being remediated. "Disposal in place" requires groundwater monitoring for a 30-year period (Ball et al. 1985). Four Resource Conservation and Recovery Act (RCRA) hazardous wastes are listed due, in part, to their creosote content (40 CFR 261.31 and 261.32 [EPA 1981a, 1981b]). These are:

- C Waste waters, process residuals, preservative dripage, and spent formulations from wood preserving processes generated at plants that use creosote formulations
- C Bottom sediment sludge from the treatment of waste waters from wood preserving processes
- C Waste water treatment sludges generated in the production of creosote
- C Off-specification creosote (does not meet desired chemical composition).

Due to RCRA Land Disposal Restrictions, creosote can no longer be disposed in hazardous waste landfills unless it meets EPA specified treatment standards (EPA 1990c). No technology- or concentration-based standards for the three RCRA hazardous wastes containing creosote specify creosote as a constituent for monitoring treatment performance (40 CFR 268.43 [EPA 1988b]). Industrially used creosote-treated wood can be burned in an industrial incinerator or boiler (EPA 1986b). Treated wood used in the home or farm should be buried or disposed with household garbage; it should not be

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incinerated (American Wood Preserver's Association 1988). The potential for many types of hazardous pollutants to be included with creosote wastes seriously diminishes the potential for recycling or re-use.

