SAMPLE EMISSION INVENTORY PLAN

Facility Information

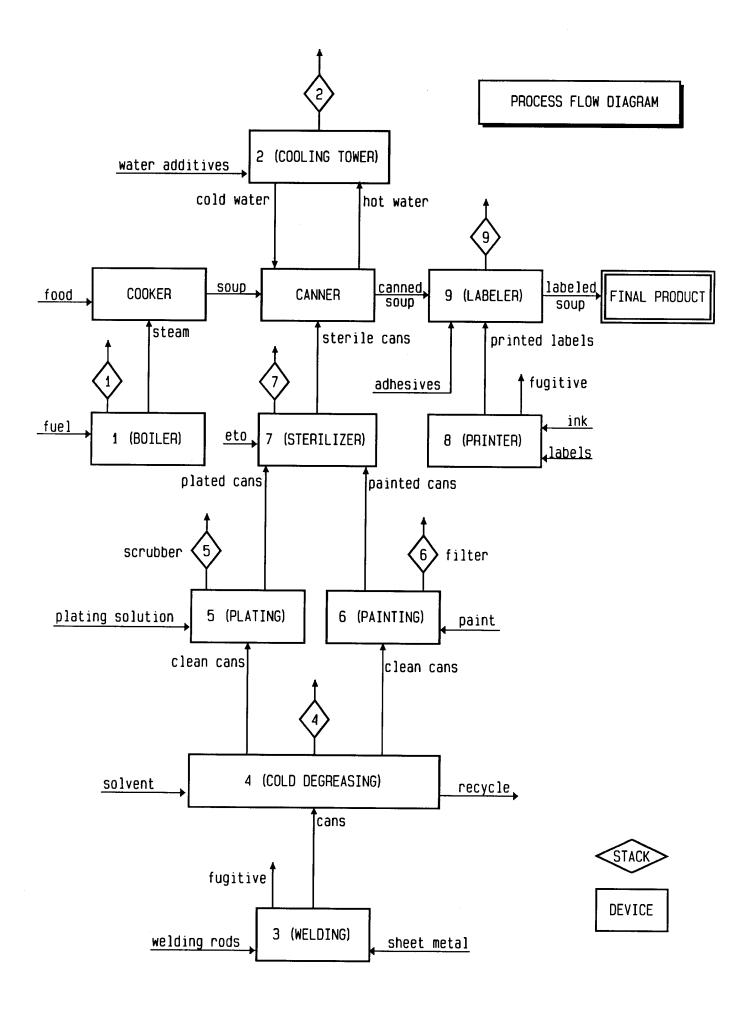|	
Facility Name:	Soups-R-Us
Facility Address:	4321 Fictitious Way
	Industryville, CA 98765
Permit Number:	9999
Facility Contact:	Johnny Toxic
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Process Description

This facility produces canned soup. Meats, vegetables, and seasonings are added to the cooker in the proper proportions for the soup being made. Water is added to the cooker according to the soup recipe. The cooker is heated by steam from the boiler.

The cans are welded together at the facility. The sides and ends are purchased pre-stamped. After welding, the cans are degreased and either chrome plated or painted. The coated cans are then sent to an ethylene oxide sterilizer prior to being filled with soup.

The soup is placed in the sterilized cans and the lids are put in place in the canner. Heat generated by the canner is removed by a cooling tower.

Blank labels are sent through the printer where the company logo as well as information about the soup is printed. After the labels are printed adhesive is applied to the back of the label and they are placed on the sealed cans. The cans are then packed and sent out.

PROCESS FLOW DIAGRAM

◇ 2

2 (COOLING TOWER)

water additives →

cold water | hot water

food → COOKER — soup → CANNER — canned soup → 9 (LABELER) — labeled soup → FINAL PRODUCT

steam

◇ 1

sterile cans

printed labels

fuel → 1 (BOILER)

eto → 7 (STERILIZER)

adhesives →

fugitive ↑

8 (PRINTER) ← ink

← labels

◇ 7

plated cans

painted cans

scrubber ◇ 5

filter ◇ 6

plating solution → 5 (PLATING)

6 (PAINTING) ← paint

clean cans

clean cans

◇ 4

solvent → 4 (COLD DEGREASING) — recycle →

cans

fugitive ↑

welding rods → 3 (WELDING) ← sheet metal

◇ STACK

☐ DEVICE

EMISSIONS AND QUANTIFICATION METHODS

DEVICE 1 - BOILER

The boiler primarily burns natural gas but occasionally burns fuel oil (diesel). Ventura Co.
APCD emission factors will be used to quantify emissions of listed compounds from the
combustion of natural gas. We also propose to use the APCD emission factors for diesel
combustion to quantify emissions from the boiler during the use of fuel oil. Since our
consumption of fuel oil is less that 2000 gallons/year, we would like to use the emission factors
as opposed to the required source test. The listed compounds emitted from this device are the
same as the compounds listed in the District's AB 2588 combustion emission factors for natural
gas and diesel.

DEVICE 2 - COOLING TOWER

Chlorine is added to the cooling tower. The chlorine reacts with organics in the water to form
chloroform. Emissions of both chlorine and chloroform from the cooling tower will be
quantified. The following method will be used to quantify chlorine emissions:

$E = DF \times WR \times C/1000000 \times T \times 8.33$

where: E = emissions (lbs/yr or lbs/hr)
                DF = drift fraction (gpm/gpm, default = 0.02)
                WR = water circulation rate (gpm)
                C = concentration (ppmw)
                T = operating time (min/yr or min/hr)

        Chlorine levels in the cooling tower are maintained at 5-10 ppm. Tests are performed on
        a daily basis to determine the chlorine level.

Chloroform emissions will be quantified using the following equation:

$E = M \times F$

where: E = emissions (lbs/yr or lbs/hr)
                M = mass of chlorine added to tower (lbs/yr or lbs/hr)
                F = chloroform emitted per mass of chlorine added (0.0034 lb/lb from p. E-II-8
                        of the Technical Guidance Document)

DEVICE 3 - WELDING

Welding rods containing lead are used to weld the cans together. This device does not have a dedicated stack associated with it and all emissions will be considered fugitive. Lead emissions will be quantified using the following equation:

$$E = M \times F \times P$$

where:
- E = emissions (lbs/yr or lbs/hr)
- M = welding rods used (lbs/yr or lbs/hr)
- F = fraction of rod volatilized (assumed 2%)
- P = % lead contained in welding rod (from MSDS)

DEVICE 4 - COLD DEGREASING

1,1,1-Trichloroethane is used to degrease the cans prior to either plating or painting the cans. The following mass balance equation will be used to quantify emissions of 1,1,1 from this device:

$$E = (U - R) \times D$$

where:
- E = emissions (lbs/yr)
- U = 1,1,1 usage (gal/yr)
- R = amount sent off-site as waste or recycling (gal/yr)
- D = density of solvent (lbs/gal from MSDS)

DEVICE 5 - PLATING

A solution of chromic acid and nitric acid is used in the plating tank. A scrubber is used to control emissions from the plating tank. The scrubber has been source tested and shown to be 95% efficient. The listed compound hexavalent chromium is emitted. Emissions will be quantified using the following equation:

$$E = EF \times 1 \text{ lb}/453,592 \text{ mg} \times C \times T \times (1\text{-}e)$$

where:
- E = emissions (lbs/yr or lbs/hr)
- EF = emission factor from the TGD (mg/amp-hour)
- C = current (amps)
- T = operating time (hours/yr or hours/hour)
- e = 95% scrubber efficiency (0.95)

DEVICE 6 - PAINTING

Paints are applied to the cans by a HVLP spray gun in an enclosed spray booth. The booth has filters to control particulate emissions (overspray). The efficiency of these filters is 99% as reported by the filter manufacturer. The paint contains xylene and hexavalent chromium. Both of these compounds will be quantified in the emission inventory report. The following equation will be used to quantify the xylene emissions:

$$E = U \times D \times P$$

where:
E = emissions (lbs/yr or lbs/hr)
U = usage of paint (gal/yr or gal/hr)
D = density of paint (lbs/gal from MSDS)
P = percent of the listed compound in the paint (from the MSDS)

Chromium emissions will be quantified using the following equation:

$$E = U \times D \times P \times (1 - TE) \times (1 - e)$$

where:
E, U, D, & P are the same as above
TE = transfer efficiency of spray gun (HVLP = 0.65)
e = 99% manufacturer listed filter efficiency (0.99)

DEVICE 7 - STERILIZER

Ethylene oxide gas mixture is used to sterilize the soup cans prior to filling. The sterilant contains the listed compounds ethylene oxide and CFC-12. The following equation will be used to quantify emissions:

$$E = C \times V \times D \times F$$

where:
E = emissions (lbs/yr or lbs/hr)
C = number of sterilizer cycles (cycles/yr or cycles/hr)
V = volume of sterilizer (cubic feet)
D = density of sterilizer gas (lbs/cubic feet)
F = fraction of compound in sterilizer gas (12% EtO; 88% CFC-12)

DEVICE 8 - PRINTER

Inks containing listed compounds are used to print labels. A mass balance equation, similar to the one used to quantify xylene emissions from the painting process, will be used to quantify emissions from the printing process. All of the volatile organic compounds in the inks are emitted. This device does not have a dedicated stack associated with it and all emissions will be considered fugitive. The following compounds are contained in the inks used at the facility:

toluene	xylenes
methanol	1,1,1-trichloroethane

DEVICE 9 - LABELER

Printed labels are glued to the cans. The glue contains the listed compound xylene. A mass balance assuming that all of the xylene in the glue is emitted will be used to quantify xylene emissions. The method to be used is the same as for the printer. An MSDS for the glue is enclosed.