

3.5 Carpenter Shops

3.5.1 General Description of Source Category

LANL operates two carpenter shops that should be included in the Operating Permit application. The carpenter shop, located at TA-15-563, under construction in 2002, consists of various saws (band, radial, table, panel), drills, and sanding and shaping equipment. Small wooden structures made in this shop are used to support materials that undergo explosives testing. During the explosives testing the wooden structures are destroyed along with the materials being tested. As such, the wooden structures do not require any coating, painting, or finishing. Thus, this shop does not include any equipment for painting, varnishing, staining or otherwise coating or finishing the wooden structures. Routine operations involve processing soft wood (>90% pine) and, on occasion, other materials such as cardboard, lexan, foam, plastics, and pressure-treated wood. No hardwood is processed in this carpenter shop.

A local exhaust ventilation system removes sawdust from TA-15-563. The exhaust system vents to a simple cyclone to capture large wood particles. This exhaust system was designed to meet Occupational Safety and Health Administration (OSHA) standards and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) for worker exposure to wood dust. It is industry practice to collect wood dust and shavings from new woodworking operations as a standard worker safety and housekeeping practice. For safety and housekeeping reasons, a cyclone or equivalent material collection device would be installed for any new shop regardless of any air quality requirements. For worker protection, the system takes advantage of administrative and management control procedures including training, displaying of signs, and documenting operating procedures such that when any piece of equipment is operated, the exhaust system and cyclone will also be turned on. For this reason, it was determined that the cyclone is an integral part of the process for woodworking and not pollution control equipment.

The carpenter shop, located at TA-3-38, built prior to 1960, consists of various saws, drill presses, grinders, and sanders. Activities involve some maintenance activities as well as the fabrication of shipping crates, cabinets and furniture, preparation of framing and plywood for construction sites, preparation of timbers for road crews, and, on occasion, assistance to outside agencies such as the Forest Service on request. The dust generated from these operations is vented through separate regional exhaust systems to one of three cyclones. Equipment that receives routine use or generates significant dust is connected to the exhaust system. There are no coating operations performed in this shop.

In addition to the two carpenter shops previously mentioned, LANL has several carpenter shops, for example, TA-3-253 and TA-54-52, that are dedicated to maintenance work. The woodworking jobs include repairs and changes to doors, window frames, cabinets, desks and tables, trim work, gloveboxes, and trailer skirting. Equipment in these shops includes saws, grinders, sanders, shapers, and planners. Carpenter shops that are dedicated to facility maintenance activities qualify as a Trivial Activity #2.

In addition, LANL has a number of small pieces of woodworking equipment located all over the Laboratory areas. Some are carried in the trucks of the craftsmen for use at the job site. Woodworking is performed outside and inside buildings. None of this equipment is ducted to exhaust systems. Individually, these pieces of equipment have potential emissions below 1 ton per year of particulate matter and are therefore insignificant. See Insignificant Activity #1.a. Insignificant and Trivial Activities are not discussed further in this section.

3.5.2 Operating Schedule

The TA-15-563 carpenter shop operates 1 shift per day. The wood must be staged, transported into the shop area, measured before being cut, and transported out of the shop area after being cut. The shop only makes wooden structures in support of explosives testing. Jobs are done as requested as researchers prepare for each test shot. This shop is not a production shop and market demand has no

influence on production rates. Additionally, each piece of equipment must be maintained on a regular basis, for example, oiled, sharpened, etc.

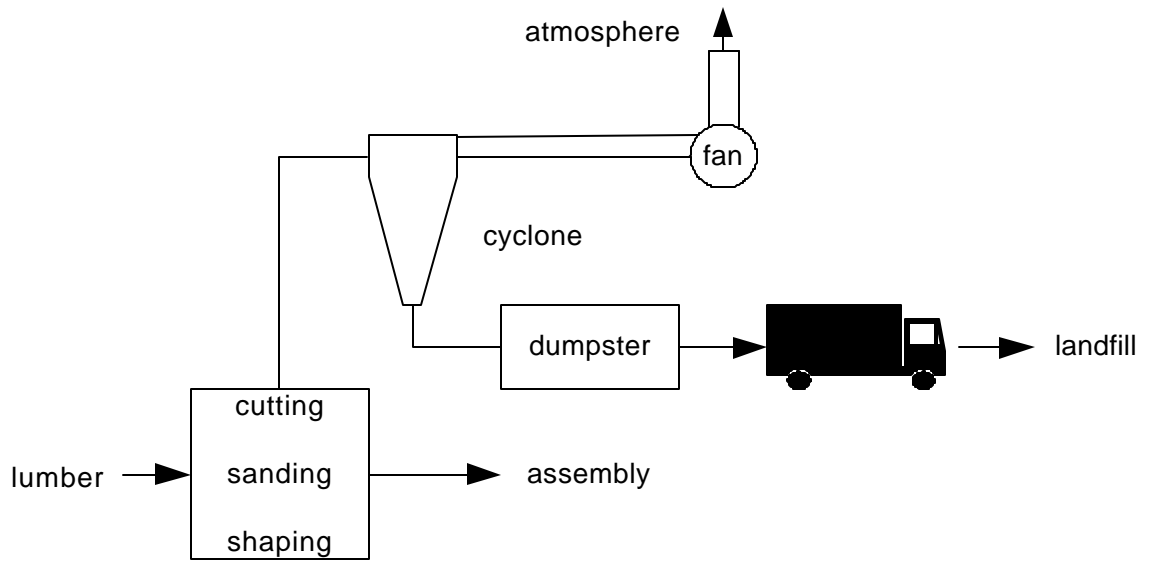
For TA-15-563, the estimate of the maximum capacity for the saws, drills, and sanding and shaping equipment is based on maximum operation of 4 hours per 8-hour shift. Maximum emissions estimates assume 3 shifts per day, 4 hours of operation per shift, 7 days per week, and 52 weeks per year, for a maximum physical limitation on the hours of operation of 4368 hours per year. It is estimated that the maximum process rate is 60 tons of wood per year with the maximum production rate of 5000 structures per year. Actual hours are closer to 8 hours per week and 50 weeks per year for approximately 400 hours per year. The typical process rate is approximately 20 tons of wood for a production rate of 1000 structures per year.

Similar to the TA-15-563 carpenter shop, the TA-3-38 shop emissions are estimated based on a maximum physical limitation on the hours of operation of 4368 hours per year. Maximum emissions estimates assume that the exhaust system is operating at a maximum rate. Actual hours are closer to 10 hours per week and 50 weeks per year for approximately 500 hours per year. Typically, only one exhaust system will be operating at any given time for a total exhaust flow rate no greater than 2700 cubic feet per minute.

3.5.3 Process Flow Diagram

The process flow diagram is presented in Figure 3.5-1. It shows the process equipment and the air emissions release point.

Figure 3.5-1. Process Flow Diagram for Carpenter Shops



3.5.4 Emissions

Emissions of total suspended particulate (TSP) and particulate matter less than 10 microns (PM₁₀) were estimated using an emission factor from AP-42, 2/80, Section 10.4, Woodworking Waste Collection Operations, Table 10.4.1. It is assumed that the PM₁₀ emissions are the same as the TSP emissions. The particulate emission factor for large diameter cyclones in woodworking waste collection systems handling waste from all operations other than sanding is 0.03 grains per standard cubic foot. With a total exhaust rate of 5000 cubic feet per minute for TA-15-563 and 5471 cubic feet per minute for TA-3-38, and 4368 hours of operation per year for each shop, post cyclone emissions are

$$Emission\ Rate\left(\frac{lb}{hr}\right) = Exhaust\ Rate\left(\frac{ft^3}{min}\right) * 0.03\left(\frac{gr}{ft^3}\right) * 60\left(\frac{min}{hr}\right) * \left(\frac{1\ lb}{7000\ gr}\right)$$

estimated as follows:

Maximum TSP and PM₁₀ emissions are shown in the following table.

Table 3.5-1. Particulate Emissions from the Carpenter Shops

$$Emission\ Rate\left(\frac{ton}{yr}\right) = Emission\ Rate\left(\frac{lb}{hr}\right) * 4368\left(\frac{hr}{yr}\right) * \left(\frac{1\ ton}{2000\ lb}\right)$$

Pollutant	Emissions (ton/year)		
	TA-15-563	TA-3-38	Total
TSP	2.81	3.07	5.88
PM ₁₀	2.81	3.07	5.88

3.5.5 Emissions Control Equipment

These shops do not have any emissions control equipment.

3.5.6 Applicable Requirements

There are no applicable requirements for the carpenter shops.

3.5.7 Proposed Monitoring, Recordkeeping, and Reporting

There are no proposed monitoring and recordkeeping requirements because there are no applicable requirements that apply to this source. There are no reporting requirements beyond the annual emissions inventory.

Table 3.5-2. Proposed Monitoring, Recordkeeping, and Reporting for Carpenter Shops

Source Category	Monitoring, Recordkeeping, and Reporting
Carpenter Shops TA-15-563 and TA-3-38	<p><i>Monitoring/Recordkeeping:</i></p> <ul style="list-style-type: none">• None. <p><i>Reporting:</i></p> <ul style="list-style-type: none">• Report criteria pollutant emissions on a semiannual basis. (20.2.73.300 NMAC and LANL proposed condition for semiannual basis)• Submit semiannual report of any required monitoring within 45 days from the end of each reporting period. The reporting periods are January to June and July to December. (20.2.70.302(E)(1) NMAC)