DESCRIPTION OF PROCESS EQUIPMENT

Iowa Lumber Company (ILCO) proposes to build a new waferboard manufacturing plant at its existing Clinton, Iowa, lumber facility. Waferboard is a plywood substitute product made of resinated wood chips, or "wafers," which are compressed into boards. In this portion of the application, we describe the process whereby aspen and pine logs are turned into waferboard.

When logs arrive at the plant, they are first cut by a saw into lengths of approximately eight feet. Once cut, the logs are moved into pools of heated water, called "hot ponds," to condition the bark for removal. The hot ponds perform the additional function of thawing out any logs which may, in the wintertime, be frozen. From the hot ponds, the logs go to the "debarker"—a machine which removes the bark. After the bark has been removed, the logs move on to the "slasher," which cuts the logs into three-foot pieces, and then to the "waferizer," which chops these pieces into one-and-half to three-inch chips, or "wafers." The wafers then go to storage bins.

From the storage bins, the wafers go to the "wafer dryer," which is a machine that combusts wood and sawdust to produce a heated "exhaust gas." The hot exhaust gas is brought into direct contact with the wood chips and thereby dries them. The chips are blown by the exhaust gas into a cyclone which, using principles of centrifugal force, separates the dried wood chips from the exhaust gas. The dried wafers then move to a "screening" process where they are separated into two different sizes and stored.

Once the chips have been screened, they move from the storage bins to a "blender," where they are mixed with adhesives and waxes for the forming process. The chips are then laid on a mat, with larger chips on the top and bottom and smaller chips in between. The material on the mat is split by a "cross-cut saw" into sections measuring eight feet by sixteen feet. These sections are then loaded into the "press," which heats and compresses the material into "waferboard." From the press, the sections of waferboard are trimmed and cut into sheets measuring four feet by eight feet by the "trim saw." These four-by-eight sheets of waferboard are the final product.

DESCRIPTION OF POLLUTION CONTROL EQUIPMENT

The process of making waferboard creates air emissions in a number of ways. First, the bark and sawdust from the slasher and debarker are combusted in a device known as a "Konus" thermal oil heater to generate much of the heat required by the plant. The main purpose of the Konus is to provide heat to the presses by means of a hot oil system, which is similar to a boiler system. The heat from the Konus is used to heat oil which, in turn, transfers that heat to the presses. A secondary purpose of the Konus is to supply heat to the hot ponds. Finally, heat from the Konus is also used to heat the building itself in the wintertime. The emissions generated by the Konus include carbon monoxide (CO) and volatile organic compounds (VOCs), as well as particulates, from the complete and incomplete combustion of the wet bark and wood that is used as fuel for the device.

Particulate emissions from the Konus combustion process are removed from the exhaust gas in two ways. First, the gas is blown into a "cyclone," which is a cylindrical device that causes the exhaust to rotate around in it. As a result of the rotation, solid material in the gas stream is thrown to the side of the device and is collected. Second, the gas exiting the cyclone is blown into a "baghouse." A baghouse is a pollution control device that operates in much the same way as a household vacuum cleaner. It consists of several fabric bags through which the exhaust is blown. The fabric catches particulate matter as the gas passes through. Finally, the gas exiting the baghouse is released to the atmosphere through a new 100 foot stack (the "main stack"), which will be the sole emission source from the new facility.

In addition to the Konus, the wafer dryer process creates a second source of air emissions. As with the Konus, the combustion process again creates CO, VOCs, and particulate emissions. Additionally, when the wood chips are heated and dried in this fashion, natural resins are released from the wood.

As noted above, exhaust gas from the combustion of wood and sawdust in the Konus is blown, along with the wood wafers being dried, to a primary cyclone where the wafers are separated from the gas. The exhaust gas continues on from the primary cyclone to a number of smaller cyclones operating at a higher velocity which remove more particulate matter from the gas stream. The gas stream from the wafer dryers is eventually released to the atmosphere through the main stack.

The presses give rise to a third source of emissions. VOCs result at this point as the heat and pressure from this process release more of the natural resins from the wood. These emissions are exhausted through the "press vents" and, eventually, to the main stack. Finally, the various saws make up a fourth source of emissions, since they generate sawdust which must be controlled. These emissions, as well, are discharged through the main stack.

PROJECTIONS OF PRODUCTION SCHEDULES AND POLLUTANT AMOUNTS

The design capability of the plant will be 240 tons per day (tpd), with the plant operating for a period of 8,000 hours per year, resulting in the production of 80,000 tons of waferboard per year (tpy). When run at its design capacity with operation of the above-described air pollution control mechanisms, the total quantities of pollutants exiting the facility through its single "main stack" will be no greater than:

Pollutant	Lb/Ton of Waferboard	Lb/Hr	Lb/Day	Tons/Yr
PM	2.58	25.8	619.2	103.2
SO2	0.11	1.1	26.4	4.4
NOx	0.488	4.88	117.12	19.52
VOC	1.32	13.2	316.8	52.8
CO	4.3	43	1032	172