

**SYNTHETIC MINOR APPLICATION EVALUATION REPORT  
LAWRENCE LIVERMORE NATIONAL LABORATORY (LLNL)  
APPLICATION 11253, PLANT 255**

**BACKGROUND:**

Lawrence Livermore National Laboratory (LLNL) has chosen to apply for a revision to its Synthetic Minor Operating Permit (SMOP) to comply with the Title V permitting requirements of the Federal Clean Air Act. The Title V permitting requirements were implemented as a result of the 1990 revisions to the Federal Clean Air Act. The initial SMOP was issued, in final draft form, on August 29, 2002, under Permit Application #1959.

Lawrence Livermore National Laboratory (LLNL) is a U.S. Department of Energy national laboratory operated by Lawrence Livermore National Security, LLC (which consists of the following team: Bechtel National, University of California, Babcock and Wilcox, Washington Division of URS Corporation, and Battelle). LLNL is devoted to experimental and theoretical research of national interest in advanced defense technologies, energy, environment, biosciences and basic sciences. Research work is constantly changing and the potential-to-emit is dynamic. The exception to this is from emissions from maintenance and operations activities. The majority of emissions of precursor organic compounds (POC), non-precursor organic compounds (NPOC) and hazardous air pollutants (HAP) are from cleaning and coating operations and research and development activities. Additional emissions in these categories are from fuel dispensing plus soil and groundwater remediation activities. LLNL has combustion sources including heaters, boilers, and internal combustion engines that emit nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), POC, sulfur oxides (SO<sub>x</sub>), and particulate matter less than 10 microns in diameter (PM<sub>10</sub>).

It was determined in 2002 that LLNL had the potential to emit greater than 100 tons per year of criteria pollutants, 25 tons per year of HAP, and 10 tons per year for any individual HAP, if all sources were to operate at maximum capacity. LLNL applied for the SMOP to obtain federally enforceable permit conditions limiting its emission of any regulated air pollutant to less than 95 tons per year, HAP emissions to less than 23 tons per year for any combination of HAP and less than 9 tons per year for any individual HAP. With this application, LLNL is requesting that the allowable NO<sub>x</sub> and POC emissions each be limited to less than 35 tons per year. (Emissions of PM<sub>10</sub>, CO and sulfur dioxide (SO<sub>2</sub>) are each well under the emission limit for NO<sub>x</sub> of 35 tons per year.)

**SOURCES COVERED BY THIS APPLICATION**

The sources covered by this application are listed in the SMOP conditions at the end of this evaluation and not repeated here since the list is a few pages long.

## **EMISSION LIMITS STRATEGY:**

To obtain a SMOP, a facility must have enforceable limits that keep the potential to emit below 95 tons per year of any regulated pollutant, below 9 tons per year of any single HAP, and below 23 tons per year of any combination of HAP.

LLNL previously agreed to accept permit conditions limiting emissions to the above limits. Since the District conditionally requires emission offsets for each new or modified source at a facility which emits 35 tons per year or more or will be permitted to emit 35 tons per year or more, on a pollutant specific basis, of POC or NO<sub>x</sub>, LLNL has requested an emission limit of less than 35 tons per year for each.

Because LLNL is a research facility, operations can be unpredictable due to project turnover. For the solvent evaporating sources, LLNL uses a variety of materials in varying amounts at different times, depending on the varying research projects. In order to provide maximum flexibility at these sources, the SMOP conditions limit mass emissions, rather than specific amounts of individual materials. LLNL is required to keep detailed records, and summarize the emissions of precursor organic compounds (POC) and hazardous air pollutants (HAP) on a monthly basis.

LLNL has four categories of sources as follows:

- (1) solvent evaporating processes such as coating, adhesive, and solvent cleaning operations
- (2) gasoline and other fuel dispensing
- (3) groundwater remediation processes, soil remediation processes, sewer wastewater diversion, oil/water separation, and vacuum truck pumping/siphoning
- (4) combustion of fuel, which results in combustion pollutants, from sources such as emergency standby engines and boilers

### **CATEGORY 1 – Solvent Evaporation**

LLNL will continue to monitor and record the amount of material used at the permitted solvent evaporating sources such as permitted coating, permitted adhesive, and permitted solvent cleaning operations. LLNL will calculate POC and HAP emissions based on a conservative emission factor of 100% solvent loss from the products (unless LLNL can document waste sent off-site for disposal or recycling). The quantities of materials used, and the chemical composition information from the associated Material Safety Data Sheets (MSDS) and/or technical data sheets shall be used to calculate emissions of POC and HAP. LLNL may use representative, product-type MSDSs and/or technical data sheets to determine the POC and HAP content of similar products, and may use MSDSs and/or technical data sheets to determine POC and HAP content of mixtures rather than determine the POC and HAP content of each component. The potential emission may be reduced by subtracting the POC and HAP content of any specific waste material collected for off-site recycling or disposal (as recorded in hazardous waste manifests). Materials collected for off-site recycling do not contribute to POC or HAP emissions at the facility,

and therefore, may be subtracted from the materials used at the facility, to yield “net POC and HAP” emissions from the facility.

Any material collected for recycle which cannot be specifically identified, such as mixtures of solvents, will not be used to reduce POC and HAP emissions from operations listed in the solvent, adhesive, and coating usage category. This method of record keeping will result in a conservative estimate of the amount of POC and HAP emissions from the plant.

LLNL performs various painting, surface preparation, and other coating of stationary structures and their appurtenances, including architectural coating (e.g., painting, staining, sealing, etc.). In addition, LLNL, applies adhesives and sealants in the construction of buildings and structures that are not themselves sources requiring permits. Because these activities are exempt from permit requirements of the District, emissions from these activities are not substantial and the POC limit for LLNL is substantially below the synthetic minor maximum limit of 95 tons per year, the emissions from facility maintenance activities are *not* required to be included in emission calculations. Included under general maintenance activities, and thus excluded from emission calculations, are LLNL’s use of exempt aerosol container products, as well as products which are exempt due to small container size.

Solvent cleaning is exempt from District permit requirements if

- (1) the cleaning solution has a VOC content less than 50 grams per liter,
- (2) the equipment or operation uses unheated solvent and contains less than 1 gallon of solvent,
- (3) the equipment or operation uses unheated solvent and has a surface area of less than 1 square foot,
- (4) the equipment uses a heated solvent mixture for steam cleaning, surface preparation, fluxing, stripping, wipe cleaning, washing or drying products where the solution contains less than 2.5 percent VOC by weight and any combustion source used in the process is exempt from permit under air district regulation.

Because of the relatively small magnitude of emissions expected and the POC limit for LLNL is substantially below the synthetic minor maximum limit of 95 tons per year, LLNL will not be required to track emissions from these and other exempt solvent cleaning operations as well as emissions from solvent wipes. Similarly, emissions from exempt laboratory fume hood operations and exempt bench scale research and development experiments (which may include use of adhesives) are expected to have a relatively small magnitude of emissions compared to the synthetic minor maximum limits for LLNL, and therefore, LLNL will not be required to track emissions from these operations.

#### CATEGORY 2 – Fuel Dispensing

The second category of sources are gasoline and E85 dispensing facilities that are used to fuel motor vehicles which emit fuel vapors. E85 is a motor fuel that is 85% ethanol and 15% gasoline. The gasoline dispensing facility has been a permitted source for many

years and the E85 dispensing facility is new. The combustion emissions from motor vehicles are not included in any SMOP condition limit. For this category, we have assumed that emissions of gasoline vapors occurring during loading, breathing, refueling and spillage are 2 pounds of gasoline (as POC) per 1,000 gallons dispensed and 6.75 pounds of benzene, a HAP, per million gallons dispensed. LLNL may also use for E85 the vapor emission factor of 2 pounds of POC per 1,000 gallons dispensed, and a benzene emission factor of 15% of 6.75 pounds per million gallons of E85 dispensed until other emission factors are provided by the District or CARB. These POC and HAP emissions from the gasoline and E85 dispensing facilities must be included with the other three categories to determine compliance with the facility-wide POC and HAP emission limits. As Such, LNLL will only be required to identify gasoline emissions as POC emissions and benzene emissions as HAP emissions for the gasoline and E85 dispensing facilities. Emissions from the dispensing of diesel are insignificant, and thus are not required to be included in determining compliance with the facility-wide POC and HAP emission limits.

CATEGORY 3 – Remediation and Wastewater

The third category of sources includes groundwater remediation processes, soil remediation processes, oil/water separation, sewage wastewater diversion, and vacuum truck pumping/siphoning to collect and/or remove pollutants, including HAP and POC, from contaminated liquids, water, and soils. These are POC and HAP sources where emissions cannot be calculated simply by multiplying throughput and solvent content. All of these sources are either subject to existing District permit conditions or are limited by their inherent design. LLNL will not be required to calculate POC and HAP emissions from these sources provided LLNL assumes POC and HAP emissions are each 1 ton in any consecutive 12-month period for this Category of sources. Because the existing District permit conditions will be incorporated into the SMOP conditions, POC and HAP emissions are not significant (each is less than 1 tpy) from these sources, as discussed below:

- Source S-3563 is a groundwater and soil vapor extraction system, abated by carbon adsorption. This source is exempt from permits but subject to District Condition ID# 10834. The system is designed so that treated groundwater and exhaust from the carbon system are re-injected into the ground. Other than fugitive leaks, there are no emissions to the atmosphere from this system. Condition ID# 10834 will be incorporated into the SMOP conditions.
- Sources listed below are also groundwater remediation equipment and soil remediation equipment abated by carbon adsorption and were analyzed in applications 8092 and 11154. POC and HAP emissions are less than 1 ton per year total (Note: For calendar year 2007, the LLNL calculated total POC emission from these sources was 9.79 pounds). These sources are subject to District Condition ID#s as listed below:

<u>Source</u>	<u>Condition ID#</u>
S-3032	21142
S-3038	21143

S-3496	21144
S-3497	21145
S-3499	21146
S-3562	21167
S-3631	21147
S-3633	21149
S-3636	21150
S-3637	21151
S-3638	21152
S-3639	21153
S-3640	21154
S-3642	21155
S-3643	21156
S-3644	21157
S-3645	21158
S-3646	21159
S-3647	21160
S-3648	21161
S-3649	21162
S-3650	21168
S-3655	21170
S-3656	21171
S-3661	21930
S-3662	21931
S-3663	21932
S-3664	21933
S-3665	21934
S-3666	21935

- Source S-3623 is an Oil/Water separator used to collect wastewater from a car wash area and from the motor pool floor drains. The organic contaminants in the wastewater are oil, grease and fuel residue. Based on AP-42, Table 5.1-2, organic emissions are 0.2 lb/1000 gallons of throughput. From the Data Form G for Source S-3623, the maximum design capacity of the oil/water separator is 1000 gal/hr. Assuming this source is used continuously at its maximum capacity, POC emissions are 0.88 tons per year. By comparison, when the emission calculation for Source S-3623 is based on the expected daily throughput of 1500 gallons, as identified in the permit application for the source (application 14801), the expected annual POC emissions are 78 pounds or 0.039 tons. Even at the maximum design capacity, emissions from this source are less than 1 ton/year. LLNL will not be required to track throughput for this source as part of the SMOP.
- Source S-6008 is a series of sewage diversion tanks that are used to hold sewage if pollutants are detected at levels higher than allowed by the Livermore Water Reclamation Plant. Because these tanks are abated by carbon adsorption system,

POC emissions from this source are negligible. Source S-6008 is subject to District Condition ID# 5533, which will be incorporated into the SMOP conditions.

- Sources S-6191 and S-6192 are two vacuum trucks that are used to handle wastewater and waste solvents. The vacuum trucks are abated by carbon adsorption. Based on the original permit evaluation for these sources (application number 17010), annual POC and NPOC emissions from all sources are 22 and 66 pounds, respectively. These sources are subject to District Condition ID# 14676, which will be incorporated into the SMOP conditions.

#### CATEGORY 4 - Combustion

The fourth category of sources, combustion sources, will be limited to emitting 35 tons per year of NO<sub>x</sub>. The POC emission from combustion sources must be included with the other three categories to determine compliance with the facility-wide POC emission limit of 35 tons in any consecutive 12-month period. Since NO<sub>x</sub>, CO, PM10 and SO<sub>2</sub> are almost exclusively emitted from combustion sources, the synthetic minor condition effectively limits combustion source emissions of CO and SO<sub>2</sub> to less than 35 tons per year since NO<sub>x</sub> is the highest emitted regulated air pollutant.

NO<sub>x</sub> and POC emissions from combustion sources shall be calculated as follows:

Emissions shall be calculated using one or more of the following methods:

- (1) continuous emission monitor systems (CEMs),
- (2) source test data,
- (3) (a) manufacturer's emissions data, or emission factors from AP-42, or the California Air Resources Board (CARB) [including CARB's Off-road Certification Database, CARB's "Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines, October 2000 (The Risk Reduction Plan)" and CARB's "California's Emissions Inventory For Off-Road Large Compression-Ignited (CI) Engines (> 25HP), January 2000" (The OFFROAD Model)],

plus

- (b) fuel supplied or actual fuel usage, run time and/or energy produced.

If emissions information is not available for a propane-fired engine, the Permit Holder may assume emissions are the same as for a natural gas fired engine.

The Permit Holder may use the NO<sub>x</sub> and POC emission factors for "commercial boilers" in Table 1.5-1 of AP-42 for propane boilers and for all other propane or LPG fired sources at the facility except internal combustion engines. The Permit Holder may use the NO<sub>x</sub> and POC emission factors for "small boilers" in Tables 1.4-1 and 1.4-2, respectively, of AP-42 for natural gas fired boilers and for all other natural gas fired sources at the facility except internal combustion engines. If an engine drives a generator and the generator output is measured, the Permit Holder may assume that it takes 1.34 horsepower-hours to produce 1 kW-hr of electricity. Emissions shall be estimated using accepted methodology that is appropriate to the emitting sources.

A couple of examples are provided to better illustrate a conservative approach to calculating emissions:

If fuel usage and engine load are not measured but run time is recorded, the Permit Holder shall assume an engine operated at full load its entire run time.

If the Permit Holder continues to retain a master natural gas meter for its facility, the Permit Holder may assume that natural gas fired engines operate at full load the entire run time and determine small boiler fuel usage by subtracting the calculated engine fuel usage from the master metered quantity since the mass emissions of NO<sub>x</sub> and POC per unit of input energy from engines are higher than the mass emissions of NO<sub>x</sub> and POC per unit of input energy from boilers.

Restated, LLNL, at its option, may calculate combustion emissions at the source level, group similar sources together, or calculate emissions using a combination of the above.

### **EMISSION CALCULATIONS**

The emissions calculation approaches for NO<sub>x</sub> and POC from combustion sources, POC and HAP from solvent evaporation sources, and POC and HAP from the gasoline dispensing facility are described above.

### **STATEMENT OF COMPLIANCE:**

This facility is in compliance with the necessary requirements in Regulation 2, Rule 6 to retain a SMOP. LLNL has voluntarily accepted enforceable permit conditions including emission limits that will keep LLNL's potential to emit under 95 tons per year of any regulated air pollutant except that NO<sub>x</sub> and POC shall each be less than 35 tons per year, 9 tons per year of any hazardous air pollutant, and 23 tons per year of any combination of hazardous air pollutants. To establish compliance, monthly totals of POC and HAP will be maintained and a 12-month rolling total will be calculated each month.

## CONDITIONS:

Lawrence Livermore National Laboratory, Plant #A0255, has a synthetic minor operating permit (SMOP). This operating permit covers all sources at the facility.

### Synthetic Minor Condition #19876

The following conditions establish the permit terms that ensure this plant is classified as a Synthetic Minor Facility under District Regulation 2, Rule 6 - Major Facility Review and ensure it is not subject to the permitting requirements of Title V of the Federal Clean Air Act as amended in 1990 and 40 CFR Part 70:

This synthetic minor condition #19876, Parts 1 through 15, and Existing conditions 5533, 10834, 14676 and 21142 through 21147, 21149 through 21162, 21167, 21168, 21170, 21171, and 21930 through 21935.

Revised conditions presented in this SMOP shall become effective 90 days from the facility's receipt of the final version of this SMOP.

All applications submitted by the applicant and all modifications to the plant's equipment after issuance of the SMOP must be evaluated to ensure that the facility cannot exceed the synthetic minor general limits below, and that sufficient monitoring, record keeping, and reporting requirements are imposed to ensure enforceability of the limits.

Any revision to a condition establishing this plant's status as a Synthetic Minor Facility or any new permit term that would limit emissions of a new or modified source for the purpose of maintaining the facility as a Synthetic Minor must undergo the procedures specified by Rule 2-6, Section 423. The basis for the synthetic minor conditions is an emission limit for regulated air pollutants of less than 95 tons per year except less than 35 tons per year for POC and less than 35 tons per year for NOx, an emission limit for a single HAP of less than 9 tons per year, and an emission limit for a combination of HAP of less than 23 tons per year.

This operating permit covers all sources issued a Permit to Operate and/or an Authority to Construct at the facility on the date of issuance. The sources are listed below.

<u>Source Number</u>	<u>Source Description</u>	
S-202	PAINT SHOP COATING OVEN (B-418)	
S-0001	Water Boiler (Bldg 111)	[exempt]
S-0002	Water Boiler (Bldg 111)	[exempt]
S-0087	Water Boiler (Bldg 381)	[exempt]
S-0088	Water Boiler (Bldg 381)	[exempt]
S-0096	Water Boiler (Bldg 435)	[exempt]
S-1054	Water Boiler (Bldg 153)	[exempt]
S-1058	Water Boiler (Bldg 490)	[exempt]
S-1059	Water Boiler (Bldg 490)	[exempt]
S-1064	Water Boiler (Bldg 191)	[exempt]
S-1065	Water Boiler (Bldg 191)	[exempt]
S-1085	Standby Stationary Diesel Engine	
S-1095	On-site Portable Diesel Engine	

S-1104	Standby Emergency Engine	
S-1110	Water Boiler (Bldg 171)	[exempt]
S-1111	Water Boiler (Bldg 181)	[exempt]
S-1115	Water Boiler (Bldg 191)	[exempt]
S-1116	Water Boiler (Bldg 191)	[exempt]
S-1119	Water Boiler (Bldg 216)	[exempt]
S-1120	Water Boiler (Bldg 217)	[exempt]
S-1121	Steam Boiler (Bldg 218)	[exempt]
S-1122	Steam Boiler (Bldg 219)	[exempt]
S-1126	Water Boiler (Bldg 251)	[exempt]
S-1128	Steam Boiler (Bldg 315)	[exempt]
S-1131	Steam Boiler (Bldg 319)	[exempt]
S-1132	Water Boiler (Bldg 321)	[exempt]
S-1133	Water Boiler (Bldg 321)	[exempt]
S-1136	Water Boiler (Bldg 363)	[exempt]
S-1139	Steam Boiler (Bldg 415)	[exempt]
S-1140	Steam Boiler (Bldg 416)	[exempt]
S-1141	Steam Boiler (Bldg 416)	[exempt]
S-1146	Water Boiler (Bldg 551)	[exempt]
S-1147	Water Boiler (Bldg 663)	[exempt]
S-1149	Water Boiler (Bldg 133)	[exempt]
S-1150	Water Boiler (Bldg 133)	[exempt]
S-1151	Water Boiler (Bldg 274)	[exempt]
S-1155	Standby Stationary Diesel Engine	
S-1156	Standby Stationary Diesel Engine	
S-1157	Standby Emergency Diesel Engine	
S-1160	Standby Emergency Engine abated by A-4251 Catalyzed Diesel Particulate Filter	
S-1161	Standby Emergency Diesel Engine, Turbocharged & Aftercooled	
S-1173	Boiler (B-131)	
S-1174	Boiler (B-131)	
S-1175	Engine-Generator Set	
S-1176	Boiler (B-581)	
S-1177	Boiler (B-581)	
S-1178	On-site Portable Diesel Engine abated by A-4247 Diesel Particulate Filter	
S-1179	On-site Portable Diesel Engine abated by A-4248 Diesel Particulate Filter	
S-1180	On-site Portable Diesel Engine abated by A-4249 Diesel Particulate Filter	
S-1181	Standby Emergency Diesel Engine	
S-1186	Standby Emergency Diesel Engine	
S-1187	Standby Emergency Diesel Engine	
S-1188	Standby Emergency Diesel Engine	
S-1192	On-site Portable Diesel Engine abated by A-4252 Diesel Particulate Filter	

S-1193 On-site Portable Diesel Engine abated by A-4253 Diesel Particulate Filter

S-1194 Standby Emergency Diesel Engine

S-1196 Emergency generator Terascale facility

S-1197 Diesel Engine, emergency generator B451, 348.9 hp

S-1200 Standby Emergency Diesel Engine

S-1201 Emergency Generator, 250kw

S-1202 Emergency Generator, 175 KW

S-1203 Emergency Generator abated by A-5036 Catalyzed Diesel Particulate Filter

S-1204 Emergency Generator Set abated by A-4235 Diesel Particulate Filter

S-1205 Standby Generator

S-1210 Standby Emergency Generator - Diesel Engine

S-1215 Emergency Standby Diesel Engine

S-1216 Emergency Diesel Engine to power firewater pump

S-1217 Emergency Standby Diesel Engine for Air Compressor

S-1218 Standby Emergency Diesel Engine Generator

S-1224 Standby Emergency Diesel Engine Generator

S-1310 Standby Stationary Diesel Engine

S-1311 Standby Stationary Diesel Engine

S-1313 Emergency Diesel Generator 141 GDE 01 [exempt]

S-1314 Standby Emergency Diesel Engine

S-1315 Standby Emergency Diesel Engine

S-1318 Standby Stationary Diesel Engine

S-1320 Standby Stationary Diesel Engine

S-1321 Standby Emergency Diesel Engine

S-1324 Standby Stationary Diesel Engine

S-1326 Standby Stationary Diesel Engine

S-1327 Standby Stationary Diesel Engine

S-1329 Standby Emergency Diesel Engine

S-1335 Standby Stationary Diesel Engine

S-1337 Standby Emergency Diesel Engine

S-1339 Standby Stationary Diesel Engine

S-1340 Standby Stationary Diesel Engine

S-1341 Standby Emergency Diesel Engine

S-1342 Standby Stationary Diesel Engine

S-1345 Standby Stationary Diesel Engine

S-1346 Standby Stationary Diesel Engine

S-1347 Standby Stationary Diesel Engine

S-1348 On-site Portable Diesel Engine abated by A-4244 Catalyzed Diesel Particulate Filter

S-1349 Standby Stationary Diesel Engine

S-1350 Standby Stationary Diesel Engine

S-1351 Standby Emergency Engine abated by A-4250 Catalyzed Diesel Particulate Filter

S-1354	Standby Emergency Engine	
S-1355	Standby Emergency Engine	
S-1357	Standby Stationary Diesel Engine	
S-1359	Standby Emergency Diesel Engine	
S-1360	Standby Emergency Diesel Engine	
S-1361	Standby Stationary Diesel Engine	
S-1363	Standby Stationary Diesel Engine	
S-1367	Standby Stationary Diesel Engine	
S-1368	Standby Stationary Diesel Engine	
S-1369	Standby Stationary Diesel Engine	
S-1370	Standby Stationary Diesel Engine	
S-1372	Standby Stationary Diesel Engine	
S-1373	Standby Emergency Engine	
S-1374	Standby Emergency Diesel Engine	
S-1375	Standby Stationary Diesel Engine	
S-1376	Standby Stationary Diesel Engine	
S-1377	Standby Stationary Diesel Engine	
S-1378	Standby Stationary Diesel Engine	
S-1400	Standby Stationary Diesel Engine	
S-1401	Standby Stationary Diesel Engine	
S-1402	Standby Emergency Diesel Engine	
S-1600	Water Boiler (Bldg 113)	[exempt]
S-1601	Water Boiler (Bldg 113)	[exempt]
S-1602	Steam Boiler (Bldg 113)	[exempt]
S-1604	Water Boiler (Bldg 121)	[exempt]
S-1605	Water Boiler (Bldg 121)	[exempt]
S-1611	Water Boiler (Bldg 151)	[exempt]
S-1612	Water Boiler (Bldg 151)	[exempt]
S-1615	Water Boiler (Bldg 194)	[exempt]
S-1617	Water Boiler (Bldg 231)	[exempt]
S-1618	Water Boiler (Bldg 231)	[exempt]
S-1633	Water Boiler (Bldg 281)	[exempt]
S-1634	Water Boiler (Bldg 311)	[exempt]
S-1639	Water Boiler (Bldg 332)	[exempt]
S-1640	Water Boiler (Bldg 332)	[exempt]
S-1641	Water Boiler (Bldg 341)	[exempt]
S-1659	Water Boiler (Bldg 695)	[exempt]
S-1662	Thermal Fluid Boiler (Bldg 361)	[exempt]
S-1663	Thermal Fluid Boiler (Bldg 361)	[exempt]
S-1668	Water Boiler (Bldg 331)	[exempt]
S-1677	Water Boiler (Bldg 253)	[exempt]
S-2004	Cold cleaner with distillation unit	
S-2039	Printing Press 2 (Rm 1550)	
S-2040	Print Press #3 (Rm 1550)	
S-2103	Wipe Cleaning Operation, Bldg 322, Rm 100	
S-2104	Wipe Cleaning Operation, Microfab Facility, Bldg 153	

S-2112 Enclosed Machine Tool Lathe, B-332 abated by A-4035 Dry Filter  
 S-2117 Silk Screen Washer, Bldg 438  
 S-2121 Bldg. 490 Complex plus Bldg. B-581/681 Manual Wipe Cleaning  
 S-2122 Cold Cleaner  
 S-2124 Bldg. 381 Manual Wipe Cleaning  
 S-2128 Wipe Cleaning Operation  
 S-2131 KDP Cleaning System  
 S-2132 Bldg 392 Manual Wipe Cleaning  
 S-2133 Bldg 493 Manual Wipe Cleaning  
 S-2136 Solvent Cold Cleaner  
 S-2137 Solvent Cold Cleaner  
 S-2138 Cold Cleaner  
 S-2500 418 SPRAY PAINT-BOOTH I abated by A-205 Scrubber  
 S-2501 418 SPRAY PAINT BOOTH II (AIR) abated by A-206 Dry Filter  
 S-2508 418 Binks Paint Spray Booth – III abated by A-2509 Scrubber  
 S-2519 Dry Film Stripper  
 S-2533 B-391 Optic Coating Operation  
 S-2534 Carpentry Shop, Bldg 511 (Adhesive Use)  
 S-2549 Machine Shop Wipe Cleaning (Bldg 321)  
 S-2569 Bldg 231 Manual Wipe Cleaning  
 S-2573 Bldg 391 Manual Wipe Cleaning: Various Locations  
 S-2575 Bldg 241 Manual Wipe Cleaning  
 S-2576 Bldg. 511 Manual Wipe Cleaning  
 S-2578 Optic Coating/KDP Crystal Spray  
 S-2579 Sol Gel Dip Tank (B391)  
 S-2580 Sol Gel Dip Tank (B391)  
 S-2581 Spin Coater (B391)  
 S-2582 Spin Coater (B391)  
 S-2583 Microtechnology Operations  
 S-3010 Blast Room (20'x30'x12') [exempt]  
 abated by A-3015 #1 Dust Collector (Baghouse) and  
 A-3016 #2 Dust Collector (Cyclone)  
 S-3012 Paper Pulverizer System abated by A-4003 Cyclone Separator and  
 by A-4004 Dust Arrestor Baghouse  
 S-3032 Groundwater Treatment System abated by A-4019 Carbon  
 Adsorption System  
 S-3038 Groundwater Treatment System abated by A-4023 Carbon  
 Adsorption System  
 S-3050 Enclosed Milling Machine B-332  
 S-3241 Electroless Copper Plating Operations [exempt]  
 S-3242 Ferric Chloride Etcher [exempt]  
 S-3244 Electroplating Clean Line [exempt]  
 S-3257 Haz Waste Drum Crusher (Bldg 612) abated by A-4116 HEPA  
 Filter  
 S-3347 Enclosed EE Machine Tool Lathe, B332  
 S-3348 Enclosed Moore T Lathe, B-332

S-3350 B153 Electrical Eng. Micro Electronics Area

S-3389 Gun/Firing Tank (10Kg) abated by A-4037 Drop Box Chamber and A-4021 Particulate Filter and A-4034 Particulate Filter

S-3390 Sphere Tank (10Kg) abated by A-4039 Drop Box Chamber and A-4022 Particulate Filter

S-3391 1 Kg Tank (North) abated by A-4132 Drop Box Chamber and A-4024 Particulate Filter

S-3392 1 Kg Tank (South) abated by A-4132 Drop Box Chamber and A-4024 Particulate Filter

S-3431 Two Stage Gas Gun Experiments [exempt]  
abated by A-4143 Dry Filter and by A-4147 Dry Filter

S-3444 Diesel Air Compressor Engine (Detroit Diesel), B-325

S-3460 2-Stage Gas Gun [exempt]  
abated by A-4166 HEPA Filter

S-3496 Groundwater Treatment System (TFC Airstripper) abated by A-4183 Carbon Adsorption System

S-3497 Groundwater Treatment System (TFD Airstripper) abated by A-4184 Carbon Adsorption System

S-3499 Groundwater Treatment System (TFG Airstripper) abated by A-4187 Carbon Adsorption System

S-3562 Soil Vapor Extraction System (B-518) abated by A-4196 B-518 Carbon Adsorber

S-3563 T5475 Air Stripper [exempt]

S-3623 Oil/Water Separator

S-3631 Groundwater Treatment System abated by A-4206 Carbon Adsorption System

S-3633 Groundwater Treatment System abated by A-4208 Carbon Adsorption System

S-3636 PTU Groundwater Air Stripper abated by A-4209 Carbon Adsorption System

S-3637 Groundwater Treatment System (PTU-4) abated by A-4210 Carbon Adsorption System

S-3638 Groundwater Treatment System (PTU-6) abated by A-4211 Carbon Adsorption System

S-3639 Groundwater Treatment System (PTU-7) abated by A-4212 Carbon Adsorption System

S-3640 Groundwater Treatment System abated by A-4213 Carbon Adsorption System

S-3642 Groundwater Treatment System (PTU #11) abated by A-4214 Carbon Adsorption System

S-3643 Groundwater Treatment System (PTU #12) abated by A-4215 Carbon Adsorption System

S-3644 Groundwater Treatment System (PTU #10) abated by A-4216 Carbon Adsorption System

S-3645 Groundwater Treatment System (MPTU #1) abated by A-3645 Carbon Adsorption System

S-3646	Groundwater Treatment System (MPTU #2) abated by A-3646 Carbon Adsorption System
S-3647	Groundwater Treatment System (MPTU #3) abated by A-3647 Carbon Adsorption System
S-3648	Groundwater Treatment System (MPTU #4) abated by A-3648 Carbon Adsorption System
S-3649	Groundwater Treatment System (MPTU #5) abated by A-3649 Carbon Adsorption System
S-3650	Soil Vapor Extraction System abated by A-3650 Carbon Adsorption System
S-3655	Soil Vapor Extraction System abated by A-3655 Carbon Adsorption System
S-3656	Soil Vapor Extraction System abated by A-3656 Carbon Adsorption System
S-3661	Soil Vapor Extraction System VES #11 abated by A-3661 Carbon Adsorption System
S-3662	Soil Vapor Extraction System VES #12 abated by A-3662 Carbon Adsorption System
S-3663	Soil Vapor Extraction System VES #13 abated by A-3663 Carbon Adsorption System
S-3664	Soil Vapor Extraction System VES #14 abated by A-3664 Carbon Adsorption System
S-3665	Soil Vapor Extraction System VES #15 abated by A-3665 Carbon Adsorption System
S-3666	Soil Vapor Extraction System VES #16 abated by A-3666 Carbon Adsorption System
S-4213	Spin-on Wafer Cleaning Operation
S-6000	Gasoline Dispensing Station (Bldg 611)
S-6008	Sewer Diversion System abated by A-4013 Carbon Canister
S-6030	E85 Dispensing Test Site (G-11639)
S-6191	1050 Gallon Vacuum Truck
S-6192	5500 Gallon Vacuum Truck
S-32100	Chemical Fume Hoods [exempt]

The following permit conditions are District conditions that do not establish this facility as a Synthetic Minor: 1525, 1526, 4324, 4852, 5191, 5548, 5587, 5602, 5742, 5965, 6092, 6640, 6641, 6642, 6643, 7615, 9716, 10051, 10270, 11037, 11044, 11478, 11741, 11758, 12040, 12536, 12581, 12629, 14321, 14658, 14753, 15898, 15925, 17685, 17686, 18817, 19328, 20345, 21766, 21767, 22490, 22820, 22830, 22850, 23310, 23311, 23384, 23514, 23523, 23583, 23712, 23810, 24038, 24059, 24060, and 24094.

**Synthetic Minor Conditions:**

1. The owner/operator shall ensure that this facility, subject to a SMOP, shall emit no more than the following quantities of emissions in any 12-month period:
  - a. 95 percent of the major source thresholds for regulated air pollutants (excluding HAP) except that NOx and POC shall each be less than 35 tons,

- b. 9 tons of any single HAP,
- c. 23 tons of any combination of HAP, and
- d. 90 percent of any lesser threshold for a single HAP as the U.S. EPA or District may establish by rule.

These limits are for the purpose of this Synthetic Minor Operator Permit only, and do not allow the owner/operator to exceed any other District permit conditions. These Synthetic Minor Operating Permit limits shall not be used as actual emissions, a permitted emission level or baseline emission levels in conjunction with new source review, banking of emission reduction credits, or any other District rule.

These limits shall include emissions from permitted, unpermitted, portable, and temporary sources at the facility except for the following sources/activities:

- 1. non-road engines as defined in 40 CFR 89
- 2. the following activities that meet an exemption in Regulation 2-1: coating of stationary structures and their appurtenances, the use of aerosol container products, and the use of other (exempt) small container products
- 3. the following solvent cleaning operations that meet an exemption in Regulation 2-1:
  - (a) the cleaning solution has a VOC content less than 50 grams per liter,
  - (b) the equipment or operation uses unheated solvent and contains less than 1 gallon of solvent,
  - (c) the equipment or operation uses unheated solvent and has a surface area of less than 1 square foot,
  - (d) the equipment uses a heated solvent mixture for steam cleaning, surface preparation, fluxing, stripping, wipe cleaning, washing or drying products where the solution contains less than 2.5 percent VOC by weight and any combustion source used in the process is exempt from permit under air district regulation.
- 4. solvent wipes that meet an exemption in Regulation 2-1
- 5. laboratory fume hood operations and bench scale research and development experiments (which may include use of adhesives) that meet an exemption in Regulation 2-1
- 6. portable equipment used for construction and/or maintenance, rented or leased for less than one year that meets an exemption in Regulation 2-1.

Because the activities are exempt from permit requirements of the District, emissions from these activities are not substantial, and the POC limit for LNLL is substantially below the synthetic minor maximum limit of 95 tons per year, the emissions from these activities are not required to be included in emission calculations.

(basis: Synthetic Minor)

**Conditions 2 - 7**

**Demonstration of Compliance for NOx for Combustion Sources:**

- 2. The owner/operator shall use the site-wide gas meter to measure throughput of natural gas used by boilers and natural gas fired equipment. The owner/operator can subtract

the natural gas used to fuel the natural gas vehicles at LLNL. To subtract the natural gas used by the vehicle fleet, the owner/operator must install a gas meter on the gas line used to fuel the vehicle fleet.

(basis: Synthetic Minor)

3. The owner/operator shall install either a fuel meter or hour meter on all diesel fuel combustion sources that are subject to air permits. (basis: Synthetic Minor)
4. The owner/operator shall maintain monthly logs and rolling 12-month total logs of the usage of diesel fuel, propane, natural gas, solid fuel and other liquid fuel when the fuel usage is used in an emission calculation.  
(basis: Synthetic Minor)
5. NOx and POC emissions from combustion sources shall be calculated as follows:

Emissions shall be calculated using one or more of the following methods:

- (1) continuous emission monitor systems (CEMs),
- (2) source test data,
- (3) (a) manufacturer's emissions data, or emission factors from AP-42, or the California Air Resources Board (CARB) [including CARB's Off-road Certification Database, CARB's "Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines, October 2000 (The Risk Reduction Plan)" and CARB's "California's Emissions Inventory For Off-Road Large Compression-Ignited (CI) Engines (> 25HP), January 2000" (The OFFROAD Model)],

plus

- (b) fuel supplied or actual fuel usage, run time and/or energy produced.

If emissions information is not available for a propane-fired engine, the Permit Holder may assume emissions are the same as for a natural gas fired engine.

The Permit Holder may use the NOx and POC emission factors for "commercial boilers" in Table 1.5-1 of AP-42 for propane boilers and for all other propane or LPG fired sources at the facility except internal combustion engines.

The Permit Holder may use the NOx and POC emission factors for "small boilers" in Tables 1.4-1 and 1.4-2, respectively, of AP-42 for natural gas fired boilers and for all other natural gas fired sources at the facility except internal combustion engines.

If an engine drives a generator and the generator output is measured, the Permit Holder may assume that it takes 1.34 horsepower-hours to produce 1 kW-hr of electricity. Emissions shall be estimated using accepted methodology that is appropriate to the emitting sources.

(basis: Synthetic Minor)

6. The owner/operator shall not use fuels other than natural gas, propane, LPG, diesel, and bio-diesel fuel at permitted sources at the facility. (This condition does not preclude LLNL from using gasoline or other alternative fuels, such as ethanol, methane, and E85 in vehicles.)  
(basis: Synthetic Minor)

7. The owner/operator shall calculate NO<sub>x</sub> and POC from all combustion sources on a rolling 12-month basis.  
(basis: Synthetic Minor)

### **Condition 8**

#### **Demonstration of Compliance for POC and HAP for Solvent Evaporating Sources:**

8. The owner/operator shall do all of the following for each of the Solvent Evaporating Sources listed above:
  - a. Maintain records of Material Safety Data Sheets (MSDS) or other product information identifying the POC content and individual HAP contents for each of the solvent-containing materials or mixtures, as appropriate, used at the sources. LLNL may use a representative, product-type MSDS and /or technical data sheet to identify the POC and HAP contents for similar products.
  - b. Keep a log of the quantity of each solvent-containing material or mixtures, as appropriate, used at each source, summarized on a monthly basis.
  - c. Calculate monthly emissions of POC, individual HAP and combination of HAP from each source, based on the POC content and individual HAP contents. The owner/operator may use a higher POC content and/or higher individual HAP content and/or higher combination HAP content in lieu of any actual material content values.
  - d. The owner/operator may keep records (i.e. waste manifests) of the amount of specific solvent-containing material disposed of as waste, and deduct such waste from the monthly POC and/or HAP emission calculations. Any material collected as waste which cannot be specifically identified, such as mixtures of solvents, shall not be used to reduce POC and HAP emissions.
  - e. Calculate POC, individual HAP and combined HAP emissions on a rolling 12-month basis for each source, except as allowed in Part 14.
  - f. Calculate total POC, individual HAP and combined HAP emissions from all sources for each month, and on a rolling 12-month basis, except as allowed in Part 14.  
(basis: Synthetic Minor)

### **Condition 9**

#### **Demonstration of Compliance for POC and HAP from Fuel Dispensing Sources:**

9. The owner/operator shall do all of the following for each of the Fuel Dispensing Sources listed above:
  - a. Maintain records of Material Safety Data Sheets (MSDS) or other product information identifying the POC content and individual HAP contents for each of the fuel or fuel mixtures, as appropriate, dispensed at the sources. LLNL may use a representative, fuel-type MSDS and /or technical data sheet to identify the POC and HAP contents for similar fuels.
  - b. Keep a log of the quantity of each fuel dispensed at each source, summarized on a monthly basis.
  - c. Calculate monthly emissions of POC (as gasoline) and combined HAP (as benzene) from each source, assuming that emissions of gasoline vapors occurring during the loading, breathing, refueling and spillage are 2 pounds of gasoline per

1,000 gallons dispensed and 6.75 pounds of benzene per million gallons dispensed. LLNL shall use for E85 the POC emission factor of 2 pounds per 1,000 gallons dispensed, and a combined HAP (as benzene) emission factor of 15% of 6.75 pounds per million gallons of E85 dispensed unless other emission factors are approved by the District or CARB.

- d. Calculate POC and combined HAP (as benzene) emissions on a rolling 12-month basis for each source.
  - e. Calculate total POC and combined HAP (as benzene) emissions from all sources for each month, and on a rolling 12-month basis.
- (basis: Synthetic Minor)

**Condition 10**

**Demonstration of Compliance for POC and HAP from wastewater and remediation sources to remove HAP from contaminated groundwater and soil:**

10. In lieu of calculating emissions from the following sources, the owner/operator has agreed to assume that
- (1) the combined POC emissions,
  - (2) the combined HAP emissions, and
  - (3) the emissions for any single HAP
- is each 1 ton in any consecutive 12-month period for the following sources:

<u>Source</u>	S-3644
S-3032	S-3646
S-3038	S-3647
S-3496	S-3648
S-3497	S-3649
S-3499	S-3650
S-3562	S-3654
S-3563	S-3655
S-3623	S-3656
S-3631	S-3661
S-3633	S-3662
S-3636	S-3663
S-3637	S-3664
S-3638	S-3665
S-3639	S-3666
S-3640	S-6008
S-3642	S-6191
S-3643	S-6192

(basis: Synthetic Minor)

**Conditions 11 through 15**

**Monthly and Annual Emissions and Non-Compliance Reporting:**

11. The owner/operator shall calculate and maintain records on a monthly basis of the quantities of NOx, POC and HAP emitted into the atmosphere as required for sources identified in the SMOP. Within 30 days of the end of each month, the NOx, POC and

HAP emissions must be totaled for the last consecutive 12-month period to ensure compliance with part 1. The owner/operator shall keep all the information required to calculate NOx, POC and HAP emissions for at least five years, and shall make those records available for review during normal business hours by the District's representatives.

(basis: Synthetic Minor)

12. The Owner/Operator shall prepare an annual emissions report. The report shall contain the following items for the year ending June 30:
  - a. Monthly report on each HAP and total combined HAP emissions for the rolling 12-month period (including the assumed 1 tpy), except as allowed by Part 14.
  - b. Monthly report on total POC emissions for the rolling 12-month period (including the assumed 1 tpy).
  - c. Monthly report on NOx emissions for the rolling 12-month period.

This report shall be submitted to the Director of Compliance and Enforcement by August 31 of each year.

(basis: Synthetic Minor)

13. Together with the annual emissions report, the owner/operator shall submit an annual certification of compliance, signed by the owner/operator's responsible official. The certification shall read: "Under penalty of perjury, I certify the following: based on information and belief formed after reasonable inquiry, the owner/operator facility has been in compliance with the synthetic minor conditions for the following period of time:\_\_\_\_\_."
14. The owner/operator shall report non-compliance with any of the above conditions in writing to the Director of Compliance and Enforcement within 10 calendar days of discovery of non-compliance.  
(basis: Synthetic Minor)
15. Individual records of each HAP are not required if the total combined HAPs from all sources at LNLL are less than 9 tpy. If the total combined HAPs from all sources at LNLL are greater than 9 tpy, LNLL shall demonstrate that no individual HAP exceeds 9 tpy. (For example, LNLL may calculate and report individual HAPs that are greater than 5 tpy to show that no single HAP is greater than 9 tpy.)  
(basis: Synthetic Minor)

Prepared by:

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February 4, 2009

APPENDIX A  
EXISTING PERMIT CONDITIONS