TECHNICAL SUPPORT DOCUMENT -
NOTICE OF CONSTRUCTION APPLICATION FOR PLATING LINE CHEMISTRY MODIFICATIONS
AT
PACIFIC AEROSPACE & ELECTRONICS, INC., WENATCHEE, WA

I. ADDITIONAL FACILITY INFORMATION

Pacific Aerospace & Electronics, Inc. (PA&E) manufactures specialized electronic equipment designed for high reliability applications in the defense, space, medical, and commercial industries.

The source is located at 434 Olds Station Road in Wenatchee, Washington, within the Northeast quarter of Section 28, Township 23 North, Range 20 East, Willamette Meridian, Chelan County.

This Notice of Construction (NOC) application is submitted to meet and modify conditions of NOC Approval Order No. 09AQ-C120 Fourth Revision regarding PA&E's new plating lines' bath chemistry compositions. There have been some modifications to some of the chemistries as well as some administrative changes such as the names of the lines and tanks.

Aside from the names of some baths and some bath chemistries, the project is as represented with the drawings and process flow diagrams submitted with the previous applications. As a part of this permit modification application, new Safety Data Sheets are provided for some new bath chemistries.

II. CONTACT INFORMATION SUMMARY

Facility Contact:	*Responsible Official:*	*Consultant Contact:*
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III. PROJECT DESCRIPTION

The new plating lab has been operational and some minor modifications to the bath constituents are needed. This application provides emissions estimates for the whole plating lab including the new chemistries. The names of each line have changed as well as the tank numbers. No changes to the existing pollution control equipment are proposed.

Operating Schedule and Production Rates

Pollution control equipment for the plating line is in use 24 hours per day, 7 days per week, and 52 weeks per year. The maximum production capacity for each tank is shown in the Process Tank Information Schedule found in spreadsheet tab X-1 of Appendix A. An excerpt of the Process Tank Information Schedule is provided below:

APPENDIX X-1

REVISED: 06/04/2024

PROCESS TANK INFORMATION SCHEDULE

Tank Line CPS #	TANK#	PROCESS TANK NAME	TANK DIMENSIONS (IN)			TANK DIMENSIONS (FT)			TANK WORKING VOL	BATH TEMP	BATH SPEC	OPEN AREA DIM. WxL	VENTILATION AIR FLOW	MAX LOAD AREA PER DAY	SURFACE AREA PER LOAD	CALCULATED LOADS PER DAY
			L (open)	W (open)	LIQUID LEVEL	L	W	LIQUID LEVEL	(GALS)	°F	GRAV	SF	(CFM)	SF	SF	Worst-case Loads/Day
700	**701**	BN CLEANER	14.0	26.0	24.0	1.17	2.17	1.83	34.7	180	**1.038**	2.5	278	25.9	6.07	4.3
	702	NITRIC ACID	12	24	24	1.00	2.00	1.83	27.4	80	**1.285**	2.0	278	25.9	6.07	4.3
	703	TITANIUM PREP	10	16	11.25	0.83	1.33	0.77	6.4	70	**1.061**	1.1	250	25.9	6.07	4.3
	703B	METHOD II PASSIVATION	11	9	3	0.92	0.75	0.08	0.4	120	**1.155**	0.7	278	25.9	6.07	4.3
	703C	CITRIC ACID PASSIVATION	11	9	3	0.92	0.75	0.08	0.4	100	**1.015**	0.7	278	25.9	6.07	4.3
	704	NEUTRALIZER	12	24	24	1.00	2.00	1.83	27.4	70	**.910**	2.0	278	25.9	6.07	4.3

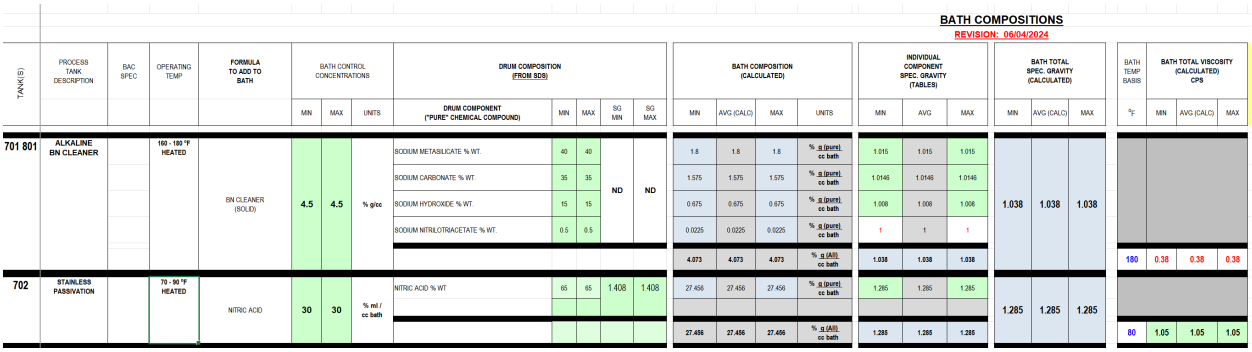
Plating Lines

There are six process lines, where plating solutions and salts are used to conduct chromate conversion and/or to plate aluminum, titanium, iron-nickel alloys, and copper.

1) Line #1 consists of Plating Line (PL) 700, a stainless and titanium passivation line; and PL 600, a cleaning and plating process for copper and copper alloys. (Formerly CPS #054 and CPS #300)
2) Line # 2 consists of PL 100, a cleaning and plating process for aluminum and aluminum alloys. (Formerly CPS #108)
3) Line #3 consists of PL 200, a cleaning and immersion process to apply hexavalent or trivalent chromium to assemblies; and PL 500, a cleaning and plating process for titanium and titanium alloys. (Formerly CPS #608 and CPS #104)
4) Line #4 consists of PL 800, a pre-/post- cleaning line for various alloys. (Formerly CPS #801)
5) Line # 5 consists of PL 400, a cleaning and plating process for iron nickel alloys, Kovar, Inconel, and stainless steel. (Formerly CPS #101)
6) Line # 6 consists of PL 300, a cleaning and plating process for pre-plated assemblies. (Formerly CPS #105)

Plating Line Solution Properties

Plating solution chemistries and bath temperatures for each tank can be found in the Bath Compositions schedule in spreadsheet tab X-2 of Appendix A. An excerpt of the Bath Compositions is provided below:



BATH COMPOSITIONS

REVISION: 06/04/2024

TANK(S)	PROCESS TANK DESCRIPTION	BAC SPEC	OPERATING TEMP	FORMULA TO ADD TO BATH	BATH CONTROL CONCENTRATIONS MIN	MAX	UNITS	DRUM COMPOSITION (FROM SDS) DRUM COMPONENT ("PURE" CHEMICAL COMPOUND)	MIN	MAX	SG MIN	SG MAX	BATH COMPOSITION (CALCULATED) MIN	AVG (CALC)	MAX	UNITS	INDIVIDUAL COMPONENT SPEC. GRAVITY (TABLES) MIN	AVG	MAX	BATH TOTAL SPEC. GRAVITY (CALCULATED) MIN	AVG (CALC)	MAX	BATH TEMP BASIS °F	BATH TOTAL VISCOSITY (CALCULATED) CPS MIN	AVG (CALC)	MAX
701 801	ALKALINE BN CLEANER		160 - 180 °F HEATED	BN CLEANER (SOLID)	4.5	4.5	% g/cc	SODIUM METASILICATE % WT.	40	40	ND	ND	1.8	1.8	1.8	% g (pure) cc bath	1.015	1.015	1.015	1.038	1.038	1.038				
								SODIUM CARBONATE % WT.	35	35			1.575	1.575	1.575	% g (pure) cc bath	1.0146	1.0146	1.0146							
								SODIUM HYDROXIDE % WT.	15	15			0.675	0.675	0.675	% g (pure) cc bath	1.008	1.008	1.008							
								SODIUM NITRILOTRIACETATE % WT.	0.5	0.5			0.0225	0.0225	0.0225	% g (pure) cc bath	1	1	1							
													4.073	4.073	4.073	% g (All) cc bath	1.038	1.038	1.038				180	0.38	0.38	0.38
702	STAINLESS PASSIVATION		70 - 90 °F HEATED	NITRIC ACID	30	30	% ml / cc bath	NITRIC ACID % WT.	65	65	1.408	1.408	27.456	27.456	27.456	% g (pure) cc bath	1.285	1.285	1.285	1.285	1.285	1.285				
													27.456	27.456	27.456	% g (All) cc bath	1.285	1.285	1.285				80	1.05	1.05	1.05

Process Flow Diagrams and Plan View Site Map

Isometric and plan view drawings of the plating processes and site view maps have been provided previously. There have been no significant changes aside from the line names/numbers.

IV. EMISSIONS ESTIMATIONS

Appendix A is a spreadsheet that provides emissions for the plating line and scrubbers. Spreadsheet tab A-1 provides uncontrolled maximum emission estimates at the tank/plating line level, while spreadsheet tab A-2 provides maximum controlled emission estimates by pollutant.

A summary of proposed maximum emissions as compared with the exemption levels for criteria pollutants is provided below in Table 1.

Table 1. Criteria Pollutant Emissions Summary

	Uncontrolled Emissions			Minimum Scrubber Efficiency for Pollutant (%)	Controlled Emissions			TPY, Controlled	Exemption Level
	Short term (lb/hr)	24-hour Day (lb/day)	Annual (lb/yr)		Short term (lb/hr)	24-hour Day (lb/day)	Annual (lb/yr)		
VOCs	6.28E-06	1.51E-04	2.75E-05	99%	6.28E-08	1.51E-06	2.75E-07	1.38E-10	2.0
PM	1.99E+00	4.77E+01	1.74E+04	99%	1.99E-02	4.77E-01	1.74E+02	8.71E-02	0.5/0.8
NOx	3.41E-01	8.18E+00	1.47E+00	95%	1.70E-02	4.09E-01	7.33E-02	3.66E-05	2.0

As shown, controlled emissions of all criteria pollutants remain less than their exemption levels. These emission levels do not take any credit for emission reductions stemming from decommissioning the previous plating line.

A summary of maximum emissions as compared with de minimis and Small Quantity Emission Rates (SQERs) for toxic air pollutants (TAPs) is provided below in Table 2.

Table 2. Toxic Air Pollutant Emissions Summary

	Uncontrolled Emissions			Minimum Scrubber Efficiency for Pollutant (%)	Controlled Emissions					
	Short term (lb/hr)	24-hour Day (lb/day)	Annual (lb/yr)		Short term (lb/hr)	24-hour Day (lb/day)	Annual (lb/yr)	De Minimis (lb/ave period)	SQER (lb/ave period)	Averaging Period
Ammonia	6.69E-01	1.61E+01	2.93E+00	99%	6.69E-03	1.61E-01	2.93E-02	1.90E+00	3.70E+01	24-hr
Arsenic	9.86E-08	2.37E-06	4.32E-07	99%	9.86E-10	2.37E-08	4.32E-09	2.50E-03	4.90E-02	Annual
Chromium (III)	8.57E-07	2.06E-05	3.75E-06	99%	8.57E-09	2.06E-07	3.75E-08	3.70E-04	7.40E-03	24-hr
Chromium (VI)	3.98E-05	9.56E-04	1.74E-04	99%	3.98E-07	9.56E-06	1.74E-06	3.30E-05	6.50E-04	Annual
Cobalt	1.75E-08	4.21E-07	7.68E-08	99%	1.75E-10	4.21E-09	7.68E-10	3.70E-04	7.40E-03	24-hr
Ferric Sulfate	7.21E-04	1.73E-02	3.16E-03	99%	7.21E-06	1.73E-04	3.16E-05	1.10E-02	2.20E-01	1-hr
Fluoride Compounds	8.68E-03	2.08E-01	3.80E-02	99%	8.68E-05	2.08E-03	3.80E-04	4.80E-02	9.60E-01	24-hr
Formaldehyde	2.66E-03	6.37E-02	1.16E-02	99%	2.66E-05	6.37E-04	1.16E-04	1.40E+00	2.70E+01	Annual
Lead	6.28E-08	1.51E-06	2.75E-07	99%	6.28E-10	1.51E-08	2.75E-09	1.00E+01	1.40E+01	Annual
Methanol	2.01E-02	4.83E-01	8.81E-02	99%	2.01E-04	4.83E-03	8.81E-04	7.40E+01	1.50E+03	24-hr
Nickel	1.37E-03	3.28E-02	6.04E-03	99%	1.37E-05	3.28E-04	6.04E-05	3.10E-02	6.20E-01	Annual
Nitric Acid	8.72E-03	2.09E-01	3.82E-02	99%	8.72E-05	2.09E-03	3.82E-04	8.00E-03	1.60E-01	1-hr
Phosphoric Acid	5.21E-01	1.25E+01	2.28E+00	99%	5.21E-03	1.25E-01	2.28E-02	2.60E-02	5.20E-01	24-hr
Sodium Hydroxide	2.75E-03	6.60E-02	1.20E-02	99%	2.75E-05	6.60E-04	1.20E-04	7.40E-04	1.50E-02	1-hr
Sulfuric Acid	4.21E-03	1.01E-01	1.84E-02	99%	4.21E-05	1.01E-03	1.84E-04	3.70E-03	7.40E-02	24-hr

While there have been revisions to the TAPs list since 2018, including revisions to many TAP de minimis and SQER thresholds, all estimated emissions remain below their respective and current de minimis or SQER thresholds.

V. OTHER EXISTING EQUIPMENT

Two natural gas-fired makeup air (MUA) units were also a part of the installation and operation of the new plating line:

- MUA-1: 2,385 MBH for Plating Lab (make-up air for scrubber operations)
- MUA-2: 534 MBH for Wash Room and Chem Lab (winter heating only)

There is also a KEI Model 3035 1500 cfm dust collector serving metal grinding operations in Building E2. This unit has been in service for many years but is not listed on any previous permits.

VI. STATE ENVIRONMENTAL POLICY ACT (SEPA) COMPLIANCE

The previous SEPA Determination of Nonsignificance for the facility and project still applies.

APPENDIX A

Emission Calculations Spreadsheet
(Sent via email)