PRIORITY 1
(ACCELERATED RIDS PROCESSING)

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9407250212 DOC.DATE: 94/07/15 NOTARIZED: NO DOCKET #
FACIL:50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylva 05000387
50-388 Susquehanna Steam Electric Station, Unit 2, Pennsylva 05000388
AUTH.NAME AUTHOR AFFILIATION
FIELDS,J.S. Pennsylvania Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
CROWLEY,K. Pennsylvania, Commonwealth of

See Reports

SUBJECT: Forwards NPDES permit application for Susquehanna Steam Electric Station,Salem Township,Luzerne County,PA.

DISTRIBUTION CODE: IE23D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 150
TITLE: Environmental Event Report (per Tech Specs)

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD1-2 PD	1	1	POSLUSNY,C	1	1
INTERNAL:	ACRS	5	5	NRR/PMAS/ILRB	1	1
	OGC/HDS2	1	1	REG FILE 01	1	1
	RGN1	1	1			
EXTERNAL:	NRC PDR	1	1	NSIC	1	1

NOTE TO ALL "RIDS" RECIPIENTS:
PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM P1-37 (EXT. 504-2083) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 13 ENCL 13

PRIORITY 1 DOCUMENT

Pennsylvania Power & Light Company
Two North Ninth Street • Allentown, PA 18101-1179 • 610/774-5151

July 15, 1994

Ms. Kate Crowley
Regional Water Quality Manager
Pennsylvania Department of Environmental Resources
90 East Union Street, 2nd Floor
Wilkes-Barre, PA 18701-3296

SUSQUEHANNA STEAM ELECTRIC STATION
RENEWAL APPLICATION FOR NATIONAL POLLUTION
DISCHARGE ELIMINATION PERMIT
PERMIT NO. 0047325
CCN 741326 FILE R9-8A
PLE- 17914

Dear Ms. Crowley:

Pennsylvania Power & Light Company is submitting a National Pollutant Elimination System (NPDES) permit application for the Susquehanna Steam Electric Station (SES), Salem Township, Luzerne County, PA. The present Susquehanna SES permit No. PA 0047325 expires in January 1995.

Enclosed are original and two copies of the application, two copies of the Preparedness Prevention and Contingency Plan, and an application payment check of $500. Also, attached to this letter are requests to update the present NPDES permit, some additional sampling data, and information about an ongoing evaluation of water treatment chemicals.

If you have any questions, please contact me at (610) 774-7889.

Sincerely,

Jerome S. Fields
Sr. Environmental Scientist - Nuclear

Enclosures

JE23

July 15, 1994

CCN 741326 FILE R9-8A
PLE- 17914
To: Ms. Kate Crowley

Copy to with Renewal Application:
NRC Document Control Desk
NRC Region I
Mr. C. Polusny, NRC Project Manager

REQUESTED PERMIT CHANGES

1. Remove internal Outfall 271, Waste Filter Bypass from the permit since it is no longer being used.

2. Remove internal Outfall 471, Waste Filter from the permit since filter is not operational and will not be used in the future.

3. Remove internal Outfall 571, Circulating Water Pumphouse Building Sump, since it collects primarily river water used for cooling and not low volume wastes.

4. Reduce sampling frequency of Outfalls 073, and 074, Units 1 and 2 Turbine Building Low Volume Waste Sumps from monthly to one to two times per year. These sump discharges are directly related to rainfall and not station operation.

5. Reduce the sampling frequency for total zinc in Cooling Tower blowdown (Outfall 071) to once per year like total chromium. We no longer use zinc as a water treatment chemical.

6. Additional grab samples were taken at the River Intake and from the Cooling Tower blowdown (Outfall 071) for arsenic, total phenols, and bis (2-Ethylhexyl) Phthlate. Initial results of Outfall 071 samples for arsenic were between 65 and <0.01 ug/l; for total phenols between 42 and <0.015 ug/l; and for bis (2-Ethylhexyl) Phthlate between 23 and <6 ug/l. Since we don't generate these three chemicals at the Susquehanna SES we decided to take four grab samples from the 1) River Intake and 2) Outfall 071 to see if these results were sampling/analysis anomalies or actually present in the blowdown. Table 1 below compares sample data from the River Intake and Outfall 071 for four sampling events. These data show that river water and blowdown results are essentially the same and are not produced from operational activities at the station. Samples were collected from May 19, 1994 through May 26, 1994.

COMPARISON OF RIVER INTAKE AND BLOWDOWN SAMPLES (OUTFALL 071)
conc.(ug/l)

ARSENIC

River Intake	<10	<10	<10	<10
Outfall 071	18	<10	<10	<10

TOTAL PHENOLS

River Intake	<5	<10	11	<10
Outfall 071	<5	<5	<7	16

BIS (2-ETHYL-HEXYL) PHTHALATE

River Intake	<2	<2	<2	<2
Outfall 071	<2	<2	<2	<2

7. Every four years the station evaluates its water treatment program and determines if changes are required. At this time proposals from several chemical companies are being reviewed. Results of this evaluation, revised permit application information and effluent quality data (Sec. C-IV, page 24), and Material Safety Data sheets will be provided as a permit application amendment to the PaDER in November 1994.

jsf/msg3687c(26)

SUSQUEHANNA STEAM ELECTRIC STATION

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

RENEWAL APPLICATION
PERMIT NO. PA 0047325

PENNSYLVANIA POWER & LIGHT COMPANY

JULY 15, 1994

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

Application for NPDES Permit
New and Existing Industrial Dischargers

Application for discharge permit is:

☐ New ☒ Renewal ☐ Modification/Amendment

for:

☒ Industrial Wastewater ☐ Stormwater ☐ Other _____

Applicant Name: Pennsylvania Power & Light Company

Name of Facility: Susquehanna Steam Electric Station

NPDES Number: (if known) PA 0047325

Facility Location: Salem Township (municipality) Luzerne (county)

Facility Address: Susquehanna Steam Electric Station
P.O. Box 467
Berwick, PA 18603

Date of Submittal: July 15, 1994

Pennsylvania Department of Environmental Resources
Water Management Program

****

Before Proceeding, Refer to

INSTRUCTIONS FOR COMPLETING FORM ER-BWQ-288.10

(NPDES PERMIT APPLICATIONS FOR

NEW AND EXISTING INDUSTRIAL DISCHARGERS)

****

APPLICATION COMPLETION AND SUBMITTAL CHECKLIST

Page	Included?	Item
	X	Three (3) copies of application package submitted
	X	Original copy of application notarized
	X	Application Fee
	X	Proper evidence of Act 14 municipality, county notification
	N/A	Proof of local newspaper public notice (for new and substantially changed discharges only)

SECTION A - PHYSICAL LOCATION AND GENERAL INFORMATION
(To be completed by All Applicants)

1	X	1.	Name of Facility
1	X	2.	Facility Location
1	X	3.	Facility Operator and Ownership Information
1	X	4.	SIC Codes
1	X	5.	General Description and Nature of Business
1	X	6.	Past and Current NPDES and WQM Part II Permits
2	X	7.	Topographic Map
2	X	8.	Outfall Location (submit copy of Topo Map with discharge location)
2	X	9.	Preparedness, Prevention, and Contingency (PPC) Plans
3	X	10.	Line Drawing
4	X	11.	Site Plan and Stormwater Runoff for outfalls discharging BOTH stormwater and process wastewater

SECTION B - NEW SOURCE DETERMINATION
(To be Completed by All Applicants if Applicable)

5	N/A	

SECTION C - DATA REQUIREMENTS FOR PROCESS, NCCW, AND SANITARY WASTEWATER DISCHARGES

6	X	I.	OUTFALLS AND ASSOCIATED WASTEWATER TREATMENT TECHNOLOGIES
7	X	II.	SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALLS
7	X	1.	Process Wastewater
8	X	2.	Other Wastewater
8	X	3.	Total Process, Miscellaneous, NCCW and Sanitary Wastewater
8	X	4.	Process Wastewater Combined with Storm Water
9	X	III.	REQUIRED AND OPTIONAL ANALYSES
9	X	1.	Optional Site-Specific Toxics Data
10	X	2.	Summary of Required Analyses Worksheet
11-23	X	3.	Analyses Results
24	X	IV.	INFORMATION ON OTHER POTENTIALLY TOXIC POLLUTANTS KNOWN OR EXPECTED TO BE PRESENT IN THE DISCHARGE
24	X	1.	Chemical Additives
25	N/A	2,3	Other Potentially Toxic Pollutants
26	N/A	4a.	GC/MS Five Peaks Pollutants
27	N/A	4b.	Other Chemicals

APPLICATION COMPLETION AND SUBMITTAL CHECKLIST (continued)

SECTION C - (continued)

28	N/A	V.	HAZARDOUS SUBSTANCE SPILL REPORTING REQUIREMENT EXEMPTION
29	X	VI.	ANTICIPATED ENVIRONMENTAL PROTECTION IMPROVEMENTS
29	X	VII.	BIOLOGICAL TOXICITY TEST DATA

SECTION D - "STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY"

30	N/A	I.	IF REQUIRED TO COMPLETE THIS SECTION, ALL PARTS ARE COMPLETE

SECTION E - MISC. INFORMATION SUBMISSION (To be Completed by All Applicants)

36	X	I.	CONTRACTED ANALYTICAL ASSISTANCE
37	N/A	II.	OTHER INFORMATION

SECTION F - CERTIFICATION AND SIGNATURES OF APPLICANT (To Be Completed by All Applicants)

38	X

Pennsylvania Power & Light Company
Two North Ninth Street • Allentown, PA 18101-1179 • 215/774-5151

Certified Mail #P514 542 463

April 13, 1994

Mr. Eugene Klein, Chief Clerk
Luzerne County Courthouse
North River Street
Wilkes-Barre, PA 18702

SUSQUEHANNA STEAM ELECTRIC STATION
NATIONAL POLLUTANT DISCHARGE ELIMINATION
SYSTEM PERMIT RENEWAL: NUMBER PA0047325
CCN 741326 FILE R9-8A
PLE-17694

Dear Mr. Klein:

In accordance with Act No. 14, P.L. 834, this letter is to notify you that Pennsylvania Power & Light Company will be submitting an application in June 1994 to the Pennsylvania Department of Environmental Resources to renew the existing National Pollutant Discharge Elimination System Permit for the Susquehanna Steam Electric Station (SES) located in Salem Township, Luzerne County, Pennsylvania. The Susquehanna SES is a nuclear generating station with two boiling water reactors, each with a generating capacity of approximately 1,130 megawatts.

If you have any questions concerning this permit renewal, please call me at (610) 774-7889.

Sincerely,

Jerome S. Fields
Senior Environmental Scientist - Nuclear

Copy to:
EPA Region III
NRC Document Control Desk
NRC Region I
Mr. R. J. Clark, NRC Sr. Project Manager
Mr. P. M. Swerdon, PA DER

Pennsylvania Power & Light Company
Two North Ninth Street • Allentown, PA 18101-1179 • 215/774-5151

Certified Mail #P514 542 464

April 13, 1994

Ms. Sandy Shuman
Secretary, Salem Township
Salem Township Municipal Building
Bell Bend Road, R.D. 1
Berwick, PA 18603

SUSQUEHANNA STEAM ELECTRIC STATION
NATIONAL POLLUTANT DISCHARGE ELIMINATION
SYSTEM PERMIT RENEWAL: NUMBER PA0047325
CCN 741326 FILE R9-8A
PLE- 17693

Dear Ms. Shuman:

In accordance with Act No. 14, P.L. 834, this letter is to notify you that Pennsylvania Power & Light Company will be submitting an application in June 1994 to the Pennsylvania Department of Environmental Resources to renew the existing National Pollutant Discharge Elimination System Permit for the Susquehanna Steam Electric Station (SES) located in Salem Township, Luzerne County, Pennsylvania. The Susquehanna SES is a nuclear generating station with two boiling water reactors, each with a generating capacity of approximately 1,130 megawatts.

If you have any questions concerning this permit renewal, please call me at (610) 774-7889.

Sincerely,

Jerome S. Fields
Senior Environmental Scientist - Nuclear

Copy to:
EPA Region III
NRC Document Control Desk
NRC Region I
Mr. R. J. Clark, NRC Sr. Project Manager
Mr. P. M. Swerdon, PA DER

2 when additional services are desired, and complete items

address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☑ Show to whom delivered, date, and addressee's address. *(Extra charge)* 2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
Mr. E. Klein, Chief Clerk
Luzerne County Courthouse
North River Street
Wilkes-Barre, PA 18702

4. Article Number
P 514 542 463

Type of Service:
☐ Registered ☐ Insured
☑ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X

6. Signature — Agent
X Richard Grabosky

7. Date of Delivery
APR 18 1994

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form 3811, Apr. 1989 *U.S.G.P.O. 1989-238-815 DOMESTIC RETURN RECEIPT

[redacted]

SENDER: Complete items 1, 2, 3 and 4; and complete items when additional services are desired,

Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☑ Show to whom delivered, date, and addressee's address. *(Extra charge)* 2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
Mr. S. Shumm, Secretary
Salem Township
Bill Board Road, R.D. #1
Berwick, PA 18603

4. Article Number
P 514 542 464

Type of Service:
☐ Registered ☐ Insured
☑ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X Kathy Brosius

6. Signature — Agent
X

7. Date of Delivery
APR 19 1994

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form 3811, Apr. 1989 *U.S.G.P.O. 1989-238-815 DOMESTIC RETURN RECEIPT

NPDES Number PA 0047325

SECTION A - PHYSICAL LOCATION AND GENERAL INFORMATION

1. Name of Facility Susquehanna Steam Electric Station

2. Facility Location (Street) U.S. Route 11

City or Town Berwick Zip Code 18603

County Luzerne

3. Facility Operator (PERMIT APPLICANT) Information. (For correspondence concerning permit application review and permit action).

Operator (PERMIT APPLICANT) Name Pennsylvania Power & Light Company

Phone (6 1 0) 774 - 7889

Street Two North Ninth Street

City or Town Allentown State PA Zip Code 18101-1179

Does the Operator own the facility? yes [X] no [ ]

Status of Operator: Federal Gov't. [ ] State Gov't. [ ] Private [X] Local Gov't. [ ]

Other

4. SIC Codes Corresponding SIC Description

1st 4 9 1 1 Electric Services

2nd

3rd

4th

5. General Description and Nature of Business

Generation of Electricity. The Susquehanna Steam Electric Station is a nuclear power station with two Boiling Water Reactors each with an electrical generating capacity of approximately 1,100 Mwe per reactor

6. List all NPDES and Part II Water Quality Management Permits presently held for this facility

1. NPDES permit no. PA 0047325, January 18, 1990
2. Water Quality permit no. 4085411, October 7, 1985
Water Quality permit no. 4076203, May 25, 1977
Water Quality permit no. 4074418, September 11, 1974

SECTION A (continued) NPDES Number PA 0047325

7. Attach Topographic Map. See instructions. See Figures A-7.1, A-7.2, and A-7.3

8. Outfall Location: For each outfall, list the latitude and longitude of its location to the nearest second and the name of the receiving water. Where available, the receiving stream width and depth should also be provided using actual measurements or topographic map and navigational charts.

FINAL OUTFALL NUMBER (list)	LATITUDE			LONGITUDE			RECEIVING WATER (Name)	Low Flow Stream	
	1. DEG.	2. MIN.	3. SEC.	1. DEG.	2. MIN.	3. SEC.		Ft. Width	Ft. Depth
070	41	5	15	76	8	45	Lake Took-a-while	160	3
071	41	5	30	76	7	45	Susquehanna River	1000	13
072	41	5	30	76	8	45	Lake Took-a-while	160	3
073	41	5	30	76	8	45	Lake Took-a-while	160	3
074	41	5	30	76	8	45	Lake Took-a-while	160	3
075	41	5	30	76	8	45	Lake Took-a-while	160	3
077	41	5	30	76	8	45	Lake Took-a-while	160	
078	41	5	30	76	8	45	Lake Took-a-while	160	3
079	41	5	30	76	8	45	Susquehanna River	1000	10
080	41	5	30	76	8	45	Lake Took-a-while	160	3

9. Preparedness, Prevention, and Contingency (PPC) Planning

Does the facility have a PPC plan which has been reviewed and approved by the Department?

☐ Yes _____ Date of Approval
☒ No (attach 2 copies for review and approval)

Does the facility have any other related plans, such as a Pollution Incident Prevention (PIP) Plan or a Spill Prevention Control and Counter Measure (SPCC) Plan? ☒ Yes ☐ No

If yes, identify and indicate date(s) approved by the Department or EPA.

The PPC plan includes -- PIP, SPCC, Best Management Practices (BMP), Contingency and Spill Prevention Response (SPR) plans.

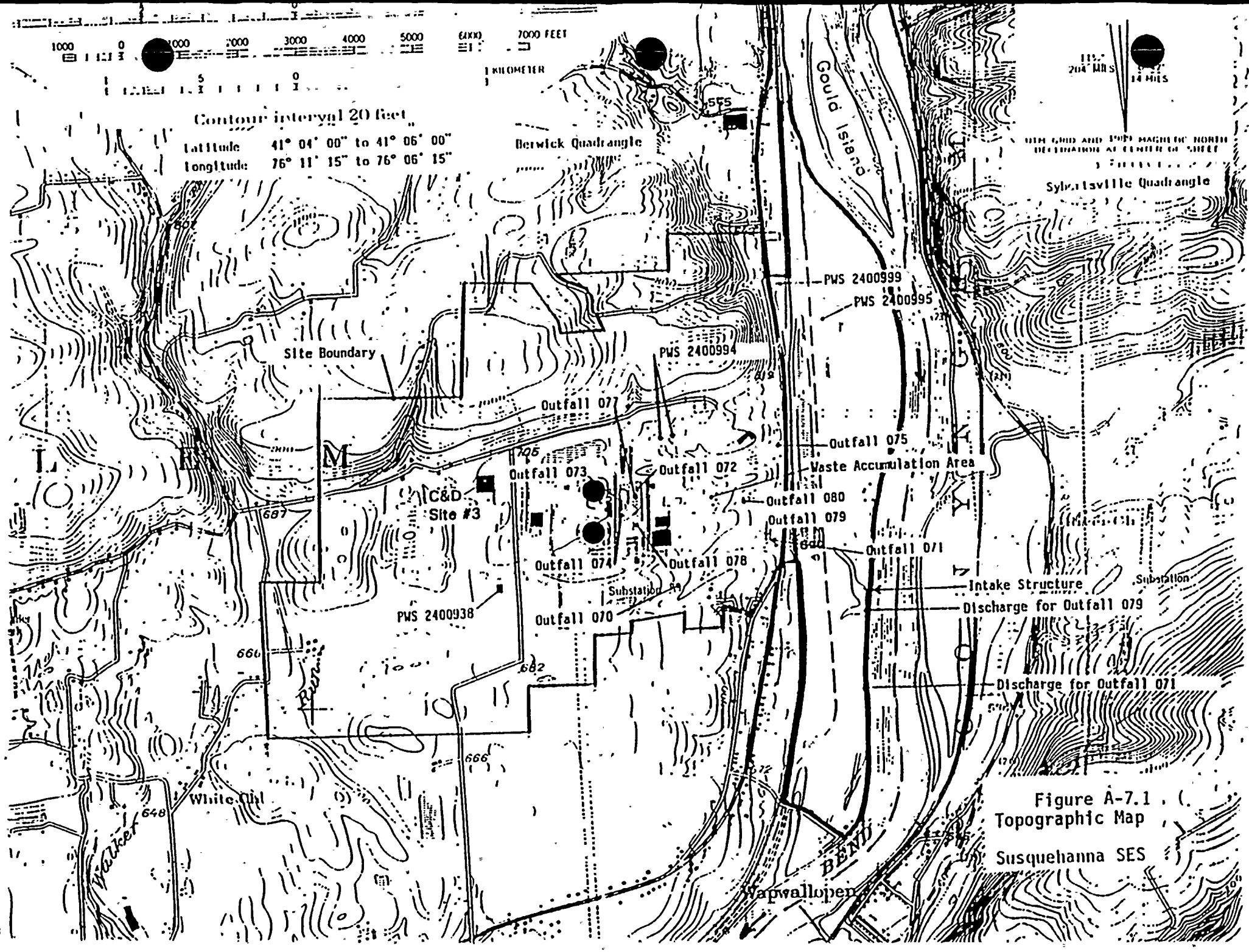
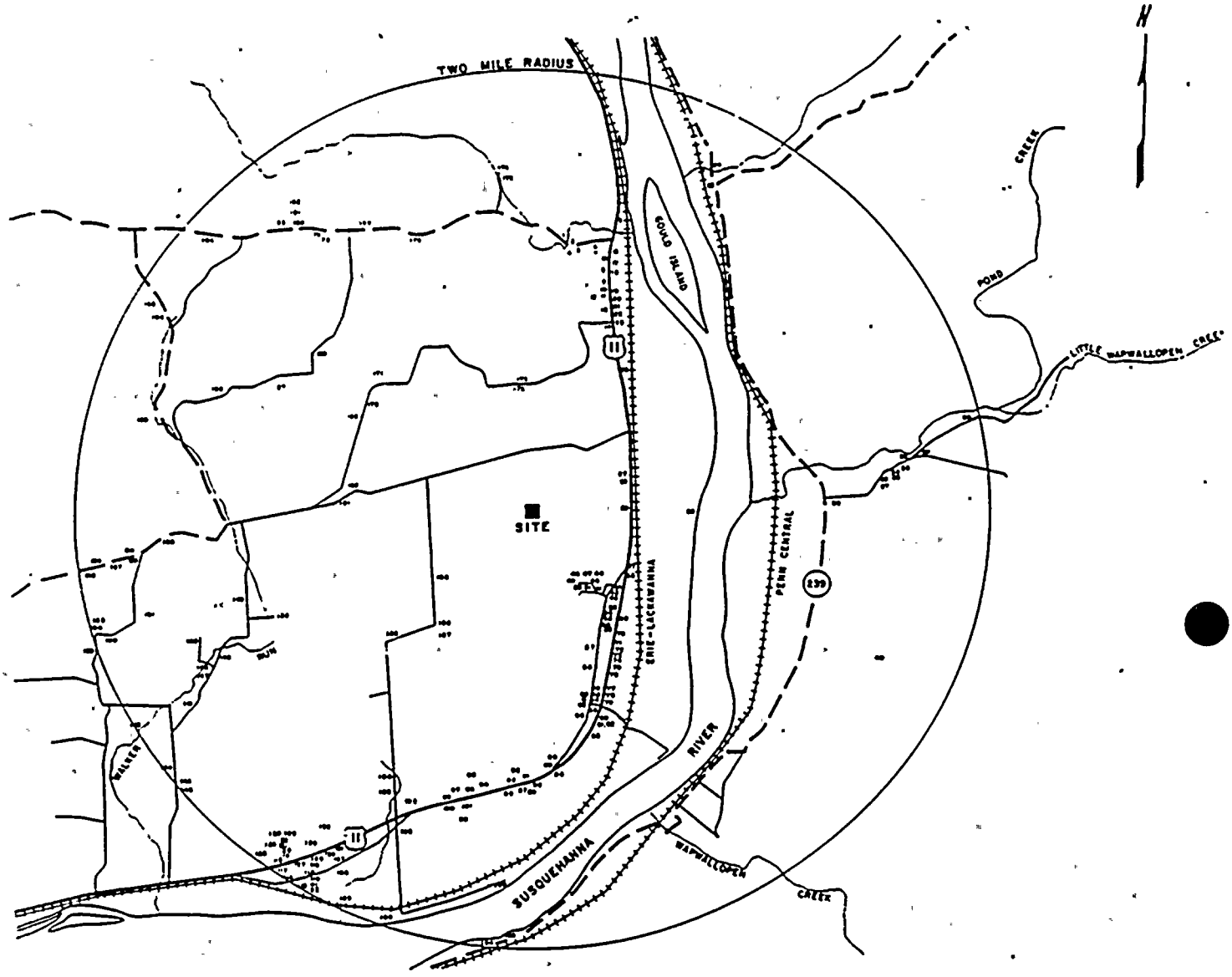


Figure A-7.1 (
Topographic Map

Susquehanna SES

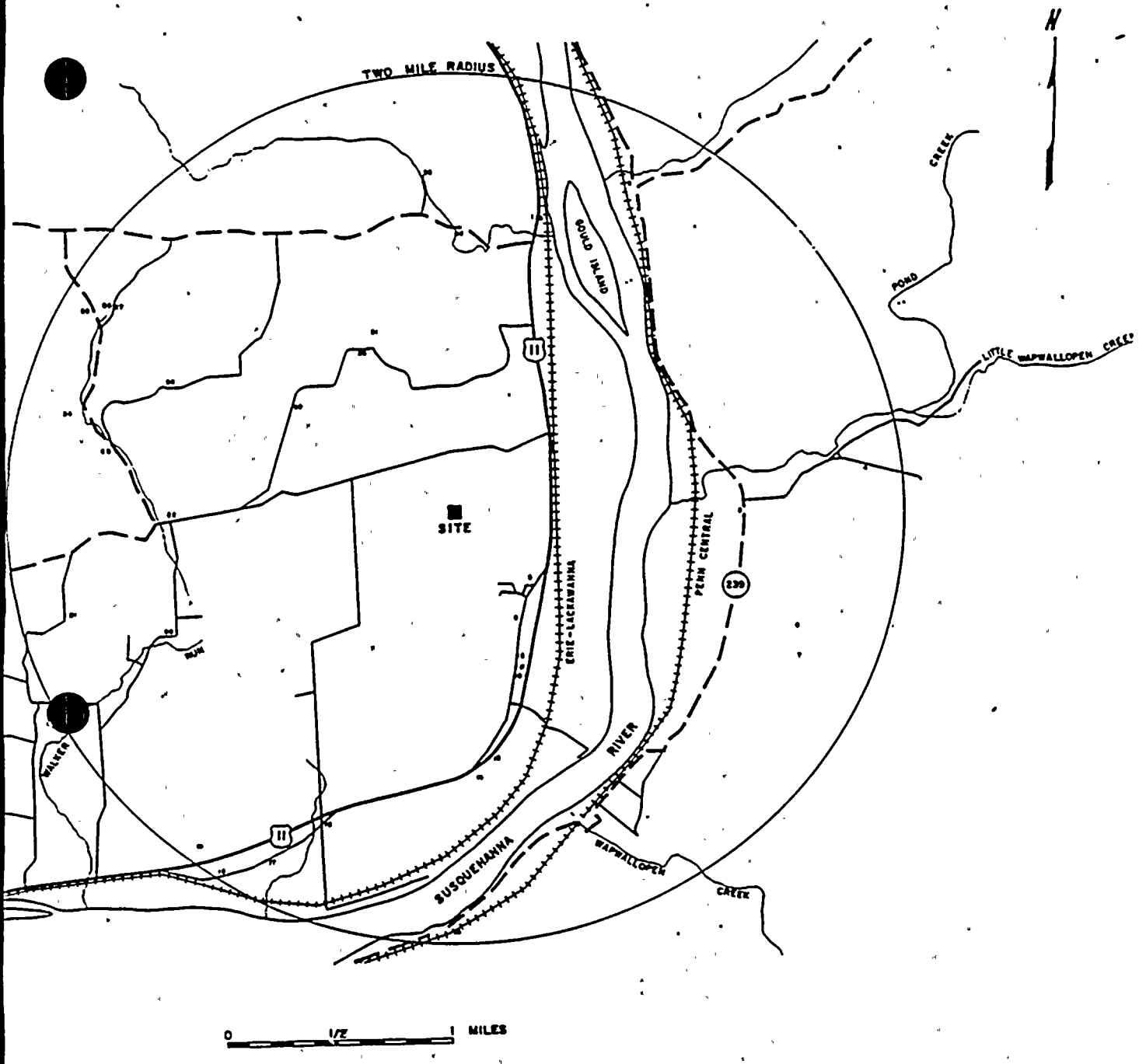


NOTE:
NUMBERS INDICATE APPROXIMATE LOCATION OF WELLS

FIGURE A-7.2

WATER WELLS WITHIN
TWO MILES OF THE STATION

SUSQUEHANNA SES



NOTE:
NUMBERS INDICATE APPROXIMATE LOCATION OF SPRINGS

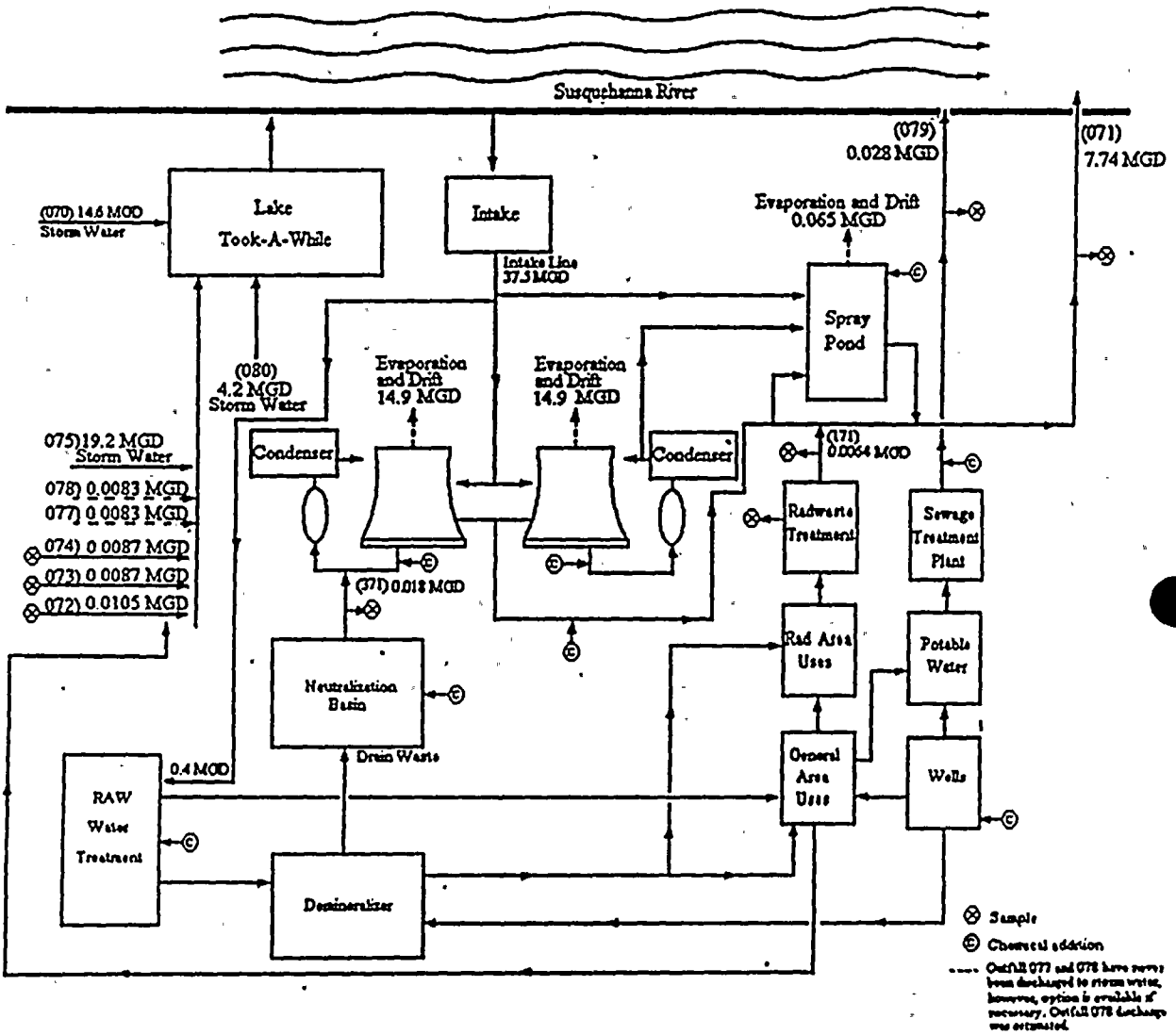
FIGURE A-7.3

SPRINGS USED FOR WATER SUPPLY
WITHIN TWO MILES OF THE STATION

SUSQUEHANNA SES

SECTION A (continued) NPDES Number PA 0047325

10. Line Drawing. See instructions.



NOTE: Outfalls 077 and 078 have never been discharged to storm water drains, however, this option is available if necessary.

SECTION A (continued) NPDES Number PA 0047325

11. Site Plan and Stormwater Runoff - Use space below or an attachment. See instructions.

Complete this part for outfalls discharging process, non-contact cooling or sanitary wastewater in combination with stormwater.

The Department strongly recommends the separation of stormwater and other wastewaters. However, if this is impossible, complete this part. Section C must be completed for the other wastewater contribution. Complete Section D for the stormwater contribution. If the stormwater can be separated, complete Section D for the stormwater outfall, and Section C for any other wastewater outfalls.

See Figure A-11

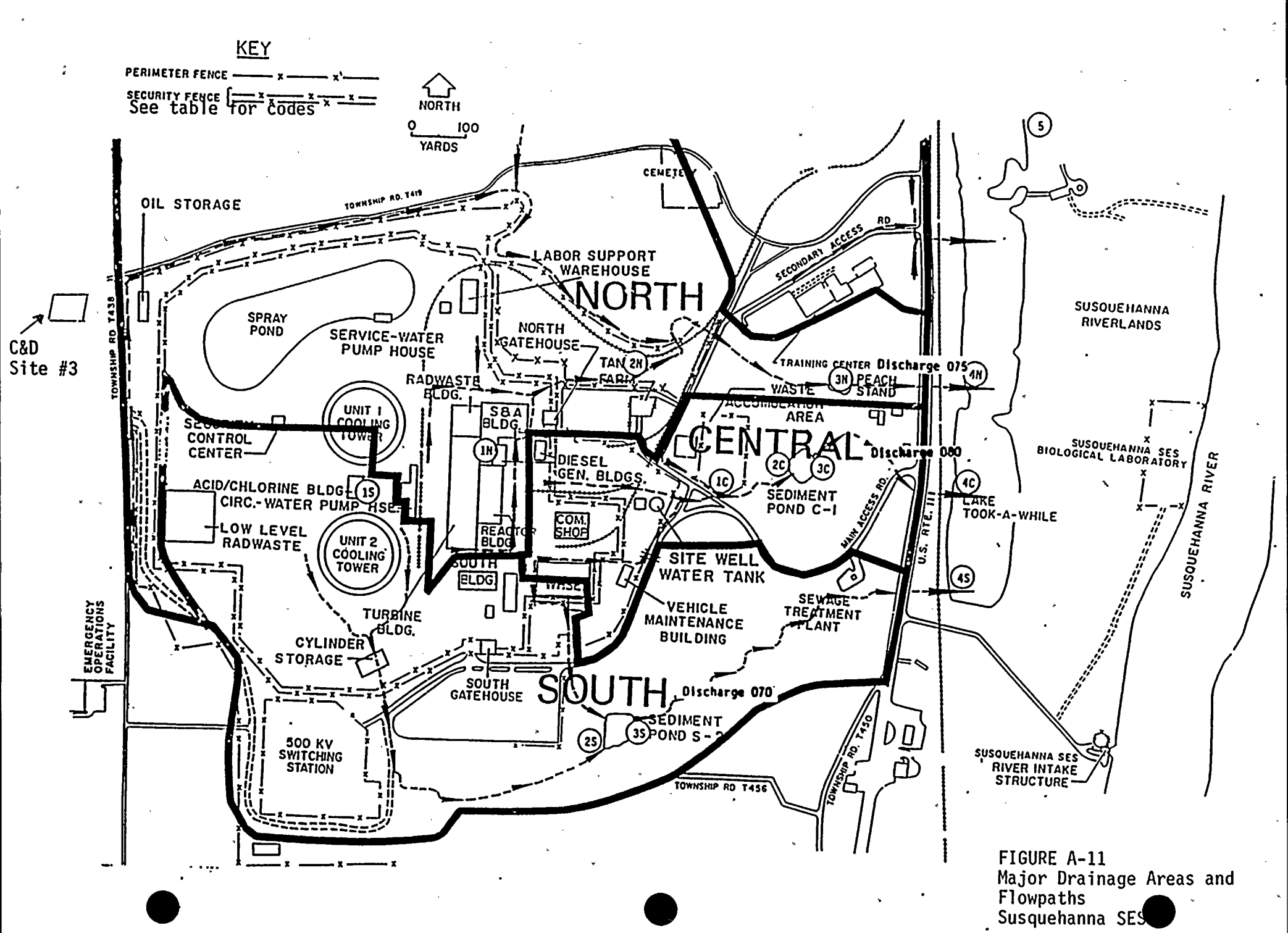


FIGURE A-11
Major Drainage Areas and
Flowpaths
Susquehanna SES

LIST OF CODES (FIGURE A-11)
SITE PLAN AND STORMWATER RUNOFF

NORTH DRAINAGE AREA

1N - Unit 1 Condensate Storage Tank

2N - Discharge of Storm Drain Near North Gatehouse Parking Lot

3N - Peach Stand (Outfall 075)

4N - Entrance to Lake Took-A-While

5 - Exit from Lake Took-A-While

CENTRAL DRAINAGE AREA

1C - Waste Accumulation Area

2C - Entrance to C-1 Pond

3C - Exit from C-1 Pond (Outfall 080)

4C - Entrance to Lake Took-A-While

5 - Exit from Lake Took-A-While

SOUTH DRAINAGE AREA

1S - Acid/Chlorine Building (no longer stores acid or chlorine)

2S - Entrance to S-2 Pond

3S - Exit of S-2 Pond

4S - Entrance to Lake Took-A-While

5 - Exit from Lake Took-A-While

NPDES Number PA 0047325

SECTION B - NEW SOURCE DETERMINATION N/A

Referring to the instructions for this question, indicate when "construction" (as defined by EPA) and discharge began for the facilities causing each discharge? If "construction" has not begun, state when it will begin.

Do not complete this table for outfalls which only discharge sanitary wastewater or stormwater runoff (unless considered "process wastewater" under an EPA effluent guideline regulation).

Date "Construction" Began*	Date Discharge Began**	Facilities Causing Discharge	Outfall(s)

* If "construction" began on different dates for facilities which contribute to the same outfall, list these dates separately (use additional sheets if necessary).

** If not yet discharging, indicate date on which discharge is expected to begin.

NPDES Number PA 0047325

SECTION C - DATA REQUIREMENTS FOR PROCESS, NCCW, AND SANITARY WASTEWATER DISCHARGES

I. OUTFALLS AND ASSOCIATED WASTEWATER TREATMENT TECHNOLOGIES

Outfall Number	Treatment Unit Description (list in sequence)	Treatment Unit Code (See Table 1)	Treatment Unit Design Flow Rate (10^6 gal/day)	Method for Handling and Disposal of Solid or Liquid Residue Resulting from Treatment (list in sequence)	Handling and Disposal Code
070	Discharge to Surface Water	4-A	Rain Dependent	Not applicable	-
	Sedimentation (settling)	1-U	Rain Dependent	Not applicable	-
071	Discharge to Surface Water	4-A	20	Not applicable	-
	Disinfection (other)	2-H	20	Not applicable	-
	Sedimentation (settling)	1-U	20	Landfill	5-Q
	Disinfection (chlorine) (optional)	2-F	20	Not applicable	-
	Dechlorination (other) (optional)	2-E	20	Not applicable	-
	Neutralization	2-K	20	Not applicable	-
171 (internal)	Diatomaceous Earth Filtration	1-C	0.28	Radioactive waste landfill	5-Q
	Ion Exchange	2-J	0.28	Radioactive waste landfill	5-Q
	Neutralization	2-K	0.28	Not applicable	-
	Evaporation (optional)	1-F	0.28	Radioactive waste landfill	5-Q
	Microstraining	1-N	0.002	Radioactive waste landfill	5-Q
371 internal	Neutralization (laundry only)	2-K	0.04	Not applicable	-
072	Oil and Grease Removal	4-H	0.023	Reuse or sale	4-E
	Discharge to Surface Water via Storm Drains	4-A	0.023	Not applicable	-
073	Oil and Grease Removal	4-H	0.018	Reuse or sale	4-E
	Discharge to Surface Water via Storm Drains	4-A	0.018	Not applicable	-

ER-BWQ-288.10: Rev. 6/93

NPDES Number PA 0047325

SECTION C - DATA REQUIREMENTS FOR PROCESS, NCCW, AND SANITARY WASTEWATER DISCHARGES

I. OUTFALLS AND ASSOCIATED WASTEWATER TREATMENT TECHNOLOGIES

Outfall Number	Treatment Unit Description (list in sequence)	Treatment Unit Code (See Table 1)	Treatment Unit Design Flow Rate (10^6 gal/day)	Method for Handling and Disposal of Solid or Liquid Residue Resulting from Treatment (list in sequence)	Handli and Dispos Code
074	Oil & Grease Removal	4-H	0.018	Reuse or sale	4-E
	Discharge to Surface Water via Storm Drains	4-A	0.018	Not applicable	-
075	Discharge to Surface Water via Storm Drains	4-A	Rain Dependent	Not applicable	-
	Sedimentation (settling)	1-U	Rain Dependent	Not applicable	-
077	Discharge to Surface Water via Storm Drains	4-A	0.024	Not applicable	-
078	Discharge to Surface Water via Storm Drains	4-A	0.019	Not applicable	
079	Grinding (comminutors)	1-L	0.08	Not applicable	-
	Screening	1-T	0.08	Incineration	5-0
	Equalization	1-Y	0.08	Not Applicable	-
	Pre-aeration	3-E	0.08	Not applicable	-
	Activated Sludge	3-A	0.08	Belt filtration; incineration	5-6; 5-0
	Neutralization	2-K	0.08	Not applicable	-
	Disinfection (chlorine)	2-F	0.08	Not applicable	-
	Dechlorination (other)	2-E	0.08	Not applicable	-
	Disinfection (other)	2-H	0.08	Not applicable	-
	Discharge to Surface Water	4-A	0.08	Not applicable	-
080	Discharge to Surface Water via Storm Drains	4-A	Rain Dependent	Not applicable	-
	Sedimentation (settling)	1-Y	Rain Dependent	Not applicable	-

ADDITIONAL INFORMATION FOR SECTION C-I

ADDITIONAL OUTFALL DESCRIPTIONS

070 - The S-2 Pond, located on the South side of the Susquehanna SES site, is a storm water runoff outfall (SWRO). This SWRO outfall may contain occasional discharges of clarified water, demineralized water, well water, and fire protection water. These discharges may contain small amounts of chlorine which will dissipate upon mixing with storm water in the pond, before the discharge reaches Lake Took-a-while. Due to the similarity of this outfall with Outfall 080, only Outfalls 075 and 080 was sampled for this NPDES permit application.

071 - Cooling Tower Blowdown includes input from both Unit 1 and Unit 2 Cooling Towers, internal discharges, and Emergency Spray Pond (Spray Pond) overflow. The Cooling Towers and Spray Pond contain river water used for cooling station main condensers and other heat exchangers throughout the station. Evaporative losses in the towers generally result in cooling water being cycled up to 3 to 5 times the concentration of river water. Cooling Tower Basins each contain approximately 7 million gallons (MG) of water and the Spray Pond about 25 MG. Discharges to the Susquehanna River generally range between 2,000 - 6,000 gpm from each tower and approximately 100 - 800 gpm from the Spray Pond. The combined station discharge is approximately 7,000 gpm or 10 MGD.

In order to reduce fouling and corrosion in the Service Water and Circulating Water Systems, PP&L utilizes a chemical treatment program. The treatment currently includes the injection of a copolymeric dispersant and a phophonate-based scale inhibitor, 1-hydroxyethylidene diphosphonic acid (HEDP). These chemicals are fed into the suction of the service water pumps at the feedrates and concentrations specified in Table 1. The range of concentrations indicated are the concentrations presently being used in the treatment program. Since the Cooling Tower Basins discharge directly to the Cooling Tower Blowdown Line, the concentrations listed in Table 1 are those expected to be present in Outfall 071.

TABLE 1
COOLING WATER TREATMENT CHEMICALS
(Outfall 071)

Chemical	Use	Normal Concentration Range (ppm)	Concentration Maximum (ppm)
Acrylate Copolymer or Propenoic/Sulfonic Acid Copolymer	Dispersion of Mud, Silt and Iron normally found in River Water	1.5 - 2.5 Active Copolymer	5.0 Active Copolymer
Hydroxyethylidene Diphosphonic Acid (HEDP)	Scale Inhibitor	0.2-1.5 as HEDP	2.5 as HEDP
Alkyl Dimethyl BenzylAmmonium Chloride (ADBAC) and Dodecyl Guanidine Hydrochloride (DGH)	Broad Spectrum Non-Oxidizing Biocide and Molluscicide	5-20 As Productor 0.6-2.6 As Total Actives	30 As Productor 3.9 As Total Active
Alkyl Dimethyl BenzylAmmonium Chloride (ADBAC)	General Biocide and Algaecide	0.5 - 5.0 As ADBAC	10.0 As ADBAC
Sulfuric Acid	pH Control	0-800	1,000
Methylbenzotriazole or Butylbenzotriazole	Copper Corrosion Inhibitor	1.2-1.8 Active Azole (Not Presently Used)	2.5 Active Azole (Not Presently Used)

A broad spectrum non-oxidizing biocide is added to each Cooling Tower on a weekly basis to control microbiological fouling in the Main Condenser and Service Water Heat Exchangers. Additionally, the algicide is added to the cooling towers to reduce algae growth and augment the microbiological control of the Main Condenser. The non-oxidizing biocide is a blend of 2 cationic surfactants - Alkyl Dimethyl Benzyl Ammonium Chloride (ADBAC) and Dodecyl Guanidine Hydrochloride (DGH). The algicide consists primarily of ADBAC. During each weekly biocide treatment, Cooling Tower Blowdown is initially isolated to contain the biocide until the actual concentration in the tower is measured. This also maximizes the contact time of the biocide with the system components. Once the tower concentration of the biocide is known, a bentonite clay slurry feed is initiated to the blowdown line. Cooling Tower Blowdown is then re-established. Biocide concentration is then measured at the effluent composite sample station to determine the effectiveness of the detoxification.

Non-indigenous mollusks such as the Asiatic clam and the Zebra mussel are not presently found in the Susquehanna River near the Susquehanna SES. Research indicates that they may some day be present and could create problems. If such species do migrate to the vicinity of the plant, PP&L plans to

utilize the same non-oxidizing biocide to periodically eliminate these mollusks from the plant intake piping as well as the Cooling Towers and Spray Pond. This material will be added over a 12-24 hr. period at a frequency of 2-4 times annually. This biocide will be detoxified with bentonite clay which will be continuously added to the Cooling Tower Blowdown Line. The bentonite clay adsorbs the biocide, deactivating the biocide. Extensive studies of the biocide and its detoxified by-products have been conducted by the vendor and are attached to Section C-VI.

The algicide is also used on a periodic basis to control algae in the Spray Pond. Approximately twice per month or less frequently in colder months, this algicide is sprayed along the edge of the pond to kill algae. This edge treatment adds less than the theoretical volume required to achieve a measurable residual in the pond itself.

Approximately twice a year, a larger volume of algicide is added to the Spray Pond to control algae in the entire pond. During these treatments, a bentonite slurry is injected into the Cooling Tower Blowdown line during and after the treatment until such time that the pond effluent contains a less-than-detectable algicide concentration. During any periods that the Spray Pond has a measurable algicide residual, station blowdown (Outfall 071) will be analyzed for the algicide at the composite sampler on a weekly basis to ensure detoxification. Special permitting for use of this product has been obtained from the PA Fish Commission and the PaDER. (Permit attached after Section C-IV.)

As an alternative to the algicide, PP&L may also add sodium hypochlorite to the edges of the pond to control algae. The sodium hypochlorite will be manually sprayed along the edges of the pond in the same manner as the algicide. The treatment frequency will be the same as that used for the algicide.

Additional weed and fish control chemicals are also used periodically in the Spray Pond. Rotenone (Nusyn-Noxfish) is used as a fish pesticide Spray Pond and Fluridone (Sonar) is used as a herbicide. Special permitting of these chemicals will be requested from the PA Fish and Boat Commission and the PaDER on an as-needed basis.

At present, pH control of the Cooling Tower is accomplished by Cooling Tower blowdown flow control. If additional pH control becomes necessary, sulfuric acid addition to the Cooling Towers can be initiated.

Because the cooling tower is normally operated at a pH above 8.0, corrosion of much of the system metals -- copper alloys and various steels -- is minimized by the alkaline water. Consequently, no copper or steel corrosion inhibitors are presently used. Azole-based copper corrosion inhibitors and zinc-based steel corrosion inhibitors have been used in the past. PP&L no longer intends to

utilize zinc compounds due to their environmental impact; however, azole-based copper corrosion inhibitors are still used in some closed components of the power plant and may be used in the larger cooling systems at a later date.

During refueling and other maintenance outage periods, cleaning of the main condensers and/or various heat exchangers is usually performed. Usually this cleaning involves only the use of high pressure water jets at a flow up to 50 gpm. Occasionally, dispersants and surfactants such as those listed in Table 1 may be added to the water jets. The daily usage rate of the chemical cleaning agents will be at or below normal operational usage rates for the chemicals stated. Additional cleaning agents are listed in Section C-IV.

Also, during refueling outages Cooling Tower basin sediment is removed and dewatered by belt filter press. A flocculant is used to enhance the dewatering process. The filtrate from the dewatering process is discharged to the Cooling Tower blowdown line. The dewatered sediment is transported offsite for disposal.

In past outages, the use of a proprietary scale removal agent was found to be effective at loosening and removing hard calcium carbonate scale which may form in the main condenser and heat exchangers depending upon the chemistry of the river. This descaling chemical is not typically found in the blowdown. When it is used, it is added to a tower while the Cooling Tower Blowdown is closed. The chemical reduces the pH of the water in the tower below 6.0, but this water is not discharged to the river during the cleaning. At the completion of the cleaning period, Cooling Tower pH is adjusted between 6.0 and 9.0 prior to re-opening the Cooling Tower Blowdown Valve. Information on this cleaning chemical is provided in Section C-VI.

The Standby Liquid Control System provides an emergency reactor shutdown mechanism which floods the reactor with a solution containing neutron-absorbing boron. This system is tested and flushed twice per quarter, resulting in the discharge of up to 1,000 gallons of a sodium pentaborate solution ($Na_2B_{10}O_{16}$) to the Cooling Tower Basin.

This sodium pentaborate solution contains 15,000 - 35,000 mg/l boron, with total quantities of boron between 100 - 300 lbs per flush. These flushes are between a pH of 6-9 and contain negligible amounts of other suspended or dissolved material. The maximum boron concentration predicted in the blowdown following each flush is less than 10 mg/l.

The closed cooling water systems listed in Table 2, Systems, contain demineralized water treated with corrosion and microbiological control chemicals. These chemicals are listed in Table 3, Closed Cooling Water

Treatment Chemicals. These chemicals may be purchased as a preblended product or added independently to maintain recommended concentrations.

By definition closed cooling systems are not routinely discharged to the environment. When maintenance is performed on these systems, batch discharges are directed to the Cooling Tower basins (Outfall 071) or the Sewage Treatment Plant (Outfall 079).

TABLE 2
SYSTEMS

SYSTEM	NO. OF SYSTEMS	SYSTEM VOLUME (gal)
Units 1 & 2 Reactor Building Closed Cooling Water	2	4,300
Units 1 & 2 Turbine Building Closed Cooling Water	2	1,150
Units 1 & 2 and Common Gaseous Radwaste Recombiner Closed Cooling Water	3	3,100
Units 1 & 2 Reactor Building Chilled Water	2	4,750
Units 1 & 2 Turbine Building Chilled Water	2	6,200
Control Structure Chilled Water	1	1,200
Radwaste Building Chilled Water	1	860
A-D Emergency Diesel General Jacket Cooling Water	4	385
E Emergency Diesel Generator Jacket Cooling Water	1	1,500

TABLE 3
CLOSED COOLING WATER TREATMENT CHEMICALS

CHEMICAL	USE	CONCENTRATION RANGE (ppm)	CONCENTRATION MAXIMUM (ppm)
Sodium Nitrite	Mild Steel Corrosion Inhibitor	500 - 1500 as NO_2	2,000
Methylbenzo Triazole (Toly Tri Azole)	Copper Corrosion Inhibitor	5-20	50
Isothiazoline	Microbiological Control Agent	35-200	250
Borate Salt	pH Buffering Agent (Diesels only)	50-150	300

INTERNAL OUTFALLS

171 - Liquid Radwaste discharge includes leakage and wastewater from the radiologically controlled area and also the Condensate Storage Tank bermed areas (Outfalls 077 & 078). Prior to combining with Outfall 071, this wastewater is passed through various treatment processes to reduce the concentration of radioactive materials. Approximately 99% of liquid radwaste is treated by one of two processes: filtration followed by ion-exchange demineralization, or ion-exchange demineralization followed by microstraining. The remaining 1% of liquid radwaste is the laundry drainage system, which receives drainage from equipment washdown stations and personnel decontamination facilities in the radiologically controlled area. This liquid is passed through a cartridge filter to remove solids prior to discharge. Currently, all laundry is sent to an outside contractor for cleaning Miscellaneous wastes discharged through this system include service water leakage, mop water from cleaning in the radiologically controlled area, and leakage from various pumps and valves.

271 - Waste Filter Bypass is no longer used and PP&L requests that this internal outfall be eliminated.

371 - Neutralization Basin internal discharge includes inputs from the demineralizer rinse water and chemical waste inputs from the Water

Treatment Building equipment and floor drains. There are two basins each with a capacity of approximately 20,000 gallons. The basins are used alternately and the contents are air sparged, recirculated, and pH adjusted prior to being directed to the suction side of the circulating water pumps.

471 - Waste Filter is no longer used and PP&L requests that this internal outfall be eliminated.

571 - Circulating Water Pumphouse Building sump receives leakage from the Circulating Water System (Outfall 071) including circulating water, seal water and Circulating Water System equipment and drains. PP&L requests that this internal discharge be eliminated since it is mainly river water and not low volume wastes.

072 - The Service and Administration (S&A) Building Low Volume Waste Sump receives inputs from the diesel generator oil unloading areas and building floor drains, the emergency start-up transformer bermed areas and the S&A Building floor drains. The sump contains two cells, each with approximately 10,500 gallon capacity. An oil and grease separator is provided to remove any fuel or transformer fluid leakage. Diesel Jacket Closed Cooling Water System leakage may also enter this sump.

073 - Outfall 073, Unit 1 Turbine Building Low Volume Waste sump is similar to Outfall 074, only this outfall collects runoff from Unit 1 while Outfall 074 collects runoff from Unit 2. Due to their similarity only Outfall 074 was sampled for this NPDES permit application.

074 - The Unit 2 Turbine Building Low Volume Waste Sump collects storm water drainage from the transformer, turbine lube oil and oil circuit breaker bermed areas. This sump, like Outfall 073, has two cells of approximately 8,700 gallons each. The water passes through an oil and grease separator prior to discharge.

Both Outfall 073 and 074 currently are sampled monthly. Analyses to date consistently show minimal levels of oil and grease and total suspended solids in Outfall 073 and 074 discharges. Because these discharges are directly related to rain fall events and not station operation, PP&L requests reduced sampling frequency to once per year.

075 - The Peach Stand Pond is a SWRO which discharges through a drainage ditch located on the North side of the site. This outfall may contain occasional discharges of clarified water, demineralized water, well water, and fire protection water. Discharge from this outfall goes into Lake Took-a-while. Due to the similarity of this outfall and Outfalls 070 and 080, only Outfall 080 was sampled for this NPDES permit application. These discharges may contain small

amounts of chlorine which will dissipate upon mixing with stormwater before discharge into Lake Took-a-while.

077 - The Unit 1 Condensate Storage Tank bermed area runoff is dependent on rainfall events and miscellaneous waste streams. Currently, flow from this outfall has been directed to Liquid Radwaste, Outfall 171. To date there has been no discharge from this outfall to the storm drains; however, PP&L would like to keep this option available.

078 - Outfall 078 is similar to Outfall 077, only this discharge collects rainfall and miscellaneous waste streams from Unit 2. PP&L would also like to keep this discharge option available. Only Outfall 077 was sampled for this NPDES permit application.

079 - The Sewage Treatment Plant (STP) is designed to treat 80,000 gallons per day of sanitary wastes from the collection system onsite and from grinder pump stations at the Training Center, Riverlands, and Environmental Lab. These sources may contain small amounts of cleaning agents and other chemicals recommended for disposal at a sewage treatment plant and other process wastes such as those described for Outfall 071.

080 - The C-1 Pond is a SWRO outfall located in the central drainage area just East of the station. This outfall may contain occasional discharges of clarified water, demineralized water, well water, and fire protection water. These discharges may contain small amounts of chlorine which will dissipate upon mixing with storm water before discharge to Lake Took-a-while.

jsf/mse3606c(26)

SECTION C (continued) NPDES Number PA 0047325

II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 070 (S-2 Pond)

1. Process Wastewater

a. Describe process and type of wastewater: N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

Process Wastewater

a. Describe process and type of wastewater: N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD

SECTION C (continued) NPDES Number PA 0047325

For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

II. SOURCES OF WASTEWATER FOR OUTFALL 070

2. Other Wastewater Contributing to this Outfall See No. 3 Below

(Description) _____

a. Source(s):

b. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr

During which months? _____

For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD

For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge flow rate _____ GPM

3. Total Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater

a. Source(s): Runoff from paved roads, roof drains

b. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr

During which months? Rain dependent

For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD

For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD

ER-BWQ-288.10: Rev. 6/93

SECTION C (continued) NPDES Number PA 0047325

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters.

Rainfall (inches)		Drainage Area Size	Units		Conversion Factor		Volume	Units
	X		Ft^2	X	0.623	=		Gallons
4.7	X	5.55×10^5	Yd^2	X	5.51	=	1.46×10^7	Gallons
	X		Acres	X	27.152	=		Gallons

III. REQUIRED AND OPTIONAL ANALYSES

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table should be used to report intake water quality, upstream background or ambient water quality, and parameter specific coefficient of effluent variability. Space is provided at the top of the table to provide description of sampling points used.)

Optional Toxics Data is attached to Application ☐ YES ☒ NO

SECTION C (continued) NPDES Number PA 0047325

II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 071
(Cooling Water Blowdown)

1. Process Wastewater

a. Describe process and type of wastewater: No. 4A (Discharge to Surface Water)

b. Applicable EPA Effluent Limitation Guideline: 40 CFR 423
Category/Subcategory Steam Electric Power

c. Maximum Monthly Production Rate: (1993)

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs
1.53×10^6	mwh (net)	electricity	March	31

d. Discharge Occurs: 24 hrs/day; 7 days/wk; 365 days/yr; 12 months/yr.
During which months? all months
For continuous discharges report:
The average discharge rate associated with the month of maximum production. 7.66 MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate N/A MGD
The maximum daily discharge rate N/A MGD
For batch discharges report:
No. of decant cycles N/A CYCLES/DAY
Length of each decant cycle N/A MIN.
Average decant discharge rate N/A GPM

Process Wastewater N/A

a. Describe process and type of wastewater:

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD

SECTION C (continued) NPDES Number PA 0047325

For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

II. SOURCES OF WASTEWATER FOR OUTFALL 071

2. Other Wastewater Contributing to this Outfall See No. 3 Below

(Description) _____

a. Source(s):

b. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr

During which months? _____

For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD

For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge flow rate _____ GPM

3. Total Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater

a. Source(s): Internal discharges: Outfall 171, Liquid Radioactive Waste and Outfall 371, Neutralization Basin

b. Discharge Occurs: -- hrs/day; -- days/wk; -- days/yr; 12 months/yr

During which months? All months; intermittent

For continuous discharges report:
The average discharge rate associated with the month of maximum production. N/A MGD

For intermittent ~~or seasonal~~ discharges report: (1993)

	Outfall 171		Outfall 371
The long-term average discharge rate	0.012	MGD	0.018 MGD
The maximum daily discharge rate	0.0835	MGD	0.051 MGD

SECTION C (continued) NPDES Number PA0047325

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters.

Rainfall (inches)		Drainage Area Size	Units		Conversion Factor		Volume	Units
	X		Ft^2	X	0.623	=		Gallons
	X		Yd^2	X	5.61	=		Gallons
4.7	X	8 (Emergency Spray Pond)	Acres	X	27.152	=	1,021	Gallons

III. REQUIRED AND OPTIONAL ANALYSES

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table should be used to report intake water quality, upstream background or ambient water quality, and parameter specific coefficient of effluent variability. Space is provided at the top of the table to provide description of sampling points used.)

Optional Toxics Data is attached to Application ☐ YES ☒ NO

SECTION C (continued) NPDES Number PA 0047325

II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 072

(Service and Admin. Bldg. Low Volume Waste Sump)

1. Process Wastewater

a. Describe process and type of wastewater: N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

Process Wastewater N/A

a. Describe process and type of wastewater:

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD

SECTION C (continued) NPDES Number PA 0047325

For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

II. SOURCES OF WASTEWATER FOR OUTFALL 072

2. Other Wastewater Contributing to this Outfall See No. 3 Below

(Description) _____

a. Source(s):

b. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr

During which months? _____

For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD

For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge flow rate _____ GPM

3. Total Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater

a. Source(s): Miscellaneous wastewater - diesel generator drains, oil storage area, and parking lot runoff

b. Discharge Occurs: 1 hrs/day; -- days/wk; 29 days/yr; 12 months/yr (1993)

During which months? _____

For continuous discharges report:
The average discharge rate associated with the month of maximum production. N/A MGD

For intermittent or seasonal discharges report:
The long-term average discharge rate 0.0105 MGD
The maximum daily discharge rate 0.021 MGD

SECTION C (continued) NPDES Number PA 0047325

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters. N/A

Rainfall (inches)		Drainage Area Size	Units		Conversion Factor		Volume	Units
_____	X	_____	Ft^2	X	0.623	=		Gallons
_____	X	_____	Yd^2	X	5.61	=		Gallons
_____	X	_____	Acres	X	27.152	=		Gallons

III. REQUIRED AND OPTIONAL ANALYSES

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table should be used to report intake water quality, upstream background or ambient water quality, and parameter specific coefficient of effluent variability. Space is provided at the top of the table to provide description of sampling points used.)

Optional Toxics Data is attached to Application ☐ YES ☒ NO

SECTION C (continued) NPDES Number PA 0047325

II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 073

1. Process Wastewater (Unit 1 Turbine Bldg. Low Volume Waste Sump)

a. Describe process and type of wastewater: N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

Process Wastewater N/A

a. Describe process and type of wastewater:

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD

SECTION C (continued) NPDES Number PA 0047325

For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

II. SOURCES OF WASTEWATER FOR OUTFALL 073

2. Other Wastewater Contributing to this Outfall See No. 3 Below

(Description) _____

a. Source(s):

b. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr

During which months? _____

For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD

For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge flow rate _____ GPM

3. Total Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater

a. Source(s): Miscellaneous wastewater - transformer area and parking area runoff.

b. Discharge Occurs: 1 hrs/day; -- days/wk; 20 days/yr; 12 months/yr (1993)

During which months? Can occur in all months; dependent on parking lot area runoff

For continuous discharges report:
The average discharge rate associated with the month of maximum production. N/A MGD

For intermittent or seasonal discharges report:
The long-term average discharge rate 0.0087 MGD
The maximum daily discharge rate 0.0174 MGD

SECTION C (continued) NPDES Number PA 0047325

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters. N/A

Rainfall (inches)		Drainage Area Size	Units		Conversion Factor		Volume	Units
_____	X	_____	Ft^2	X	0.623	=		Gallons
_____	X	_____	Yd^2	X	5.61	=		Gallons
_____	X	_____	Acres	X	27.152	=		Gallons

III. REQUIRED AND OPTIONAL ANALYSES

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table should be used to report intake water quality, upstream background or ambient water quality, and parameter specific coefficient of effluent variability. Space is provided at the top of the table to provide description of sampling points used.)

Optional Toxics Data is attached to Application ☐ YES ☒ NO

SECTION C (continued) NPDES Number PA 0047325

II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 074

(Unit 2 Turbine Bldg., Low Volume Waste Sump)

1. Process Wastewater

a. Describe process and type of wastewater: N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

Process Wastewater N/A

a. Describe process and type of wastewater:

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD

SECTION C (continued) NPDES Number PA 0047325

For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

II. SOURCES OF WASTEWATER FOR OUTFALL 074

2. Other Wastewater Contributing to this Outfall See No. 3 Below

(Description) _____

a. Source(s):

b. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr

During which months? _____

For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD

For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge flow rate _____ GPM

3. Total Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater

a. Source(s): Miscellaneous Wastewater-transformer area, parking area runoff

b. Discharge Occurs: 1 hrs/day; -- days/wk; 18 days/yr; 12 months/yr (1993)

During which months? Can occur in all months, dependent on parking area runoff

For continuous discharges report:
The average discharge rate associated with the month of maximum production. N/A MGD

For intermittent or seasonal discharges report:
The long-term average discharge rate 0.0087 MGD
The maximum daily discharge rate 0.0174 MGD

SECTION C (continued) NPDES Number PA 0047325

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters. N/A

Rainfall (inches)		Drainage Area Size	Units		Conversion Factor		Volume	Units
_____	X	_____	Ft^2	X	0.623	=		Gallons
_____	X	_____	Yd^2	X	5.61	=		Gallons
_____	X	_____	Acres	X	27.152	=		Gallons

III. REQUIRED AND OPTIONAL ANALYSES

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table should be used to report intake water quality, upstream background or ambient water quality, and parameter specific coefficient of effluent variability. Space is provided at the top of the table to provide description of sampling points used.)

Optional Toxics Data is attached to Application ☐ YES ☒ NO

SECTION C (continued) NPDES Number PA 0047325

II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 075 (Peach Stand Pond)

1. Process Wastewater

a. Describe process and type of wastewater: N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

Process Wastewater N/A

a. Describe process and type of wastewater:

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD

SECTION C (continued) NPDES Number PA 0047325

For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

II. SOURCES OF WASTEWATER FOR OUTFALL 075

2. Other Wastewater Contributing to this Outfall See No. 3 Below

(Description) _____

a. Source(s):

b. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr

During which months? _____

For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD

For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge flow rate _____ GPM

3. Total Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater

a. Source(s): Runoff from paved roads, roof drains; Discharges from Outfalls 072, 073, 074

b. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr

During which months? Rain dependent

For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD

For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD

SECTION C (continued) NPDES Number PA 0047325

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters.

Rainfall (inches)		Drainage Area Size	Units		Conversion Factor		Volume	Units
	X		Ft^2	X	0.623	=		Gallons
4.7	X	7.25×10^5	Yd^2	X	5.61	=	1.92×10^7	Gallons
	X		Acres	X	27.152	=		Gallons

III. REQUIRED AND OPTIONAL ANALYSES

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table should be used to report intake water quality, upstream background or ambient water quality, and parameter specific coefficient of effluent variability. Space is provided at the top of the table to provide description of sampling points used.)

Optional Toxics Data is attached to Application ☐ YES ☒ NO

SECTION C (continued) NPDES Number PA 0047325

II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 077

1. Process Wastewater (Unit 1 Condensate Storage Tank Bermed Area)

a. Describe process and type of wastewater: N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

Process Wastewater N/A

a. Describe process and type of wastewater:

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD

ER-BWQ-288.10: Rev. 6/93

SECTION C (continued) NPDES Number PA 0047325

For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

II. SOURCES OF WASTEWATER FOR OUTFALL 077

2. Other Wastewater Contributing to this Outfall See No. 3 Below

(Description) _____

a. Source(s):

b. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr

During which months? _____

For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD

For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge flow rate _____ GPM

3. Total Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater
Area drains, storm water, and Condensate Storage Tank drains

a. Source(s):

b. Discharge Occurs: -- hrs/day; -- days/wk; 12 days/yr; -- months/yr

During which months? Discharges can be sent either to Liquid Radwaste or storm drains. There has never been a discharge to storm drains.

For continuous discharges report:
The average discharge rate associated with the month of maximum production. N/A MGD

For intermittent or seasonal discharges report:
The long-term average discharge rate 0.0083 MGD
The maximum daily discharge rate 0.024 MGD*

*Design flow

SECTION C (continued) NPDES Number PA 0047325

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters. N/A

Rainfall (inches)		Drainage Area Size	Units		Conversion Factor		Volume	Units
_____	X	_____	Ft^2	X	0.623	=		Gallons
_____	X	_____	Yd^2	X	5.61	=		Gallons
_____	X	_____	Acres	X	27.152	=		Gallons

III. REQUIRED AND OPTIONAL ANALYSES

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table should be used to report intake water quality, upstream background or ambient water quality, and parameter specific coefficient of effluent variability. Space is provided at the top of the table to provide description of sampling points used.)

Optional Toxics Data is attached to Application ☐ YES ☒ NO

SECTION C (continued) NPDES Number PA 0047325

II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 078
(Unit 2 Condensate Storage Tank Bermed Area)

1. Process Wastewater

a. Describe process and type of wastewater: N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

Process Wastewater N/A

a. Describe process and type of wastewater:

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD

SECTION C (continued) NPDES Number PA 0047325

For batch discharges report:

No. of decant cycles	_____	CYCLES/DAY
Length of each decant cycle	_____	MIN.
Average decant discharge rate	_____	GPM

II. SOURCES OF WASTEWATER FOR OUTFALL 078

2. Other Wastewater Contributing to this Outfall See No. 3 Below

(Description) _____

a. Source(s):

b. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr

During which months? _____

For continuous discharges report:

The average discharge rate associated with the month of maximum production.	_____	MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate	_____	MGD
The maximum daily discharge rate	_____	MGD

For batch discharges report:

No. of decant cycles	_____	CYCLES/DAY
Length of each decant cycle	_____	MIN.
Average decant discharge flow rate	_____	GPM

3. Total Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater

a. Source(s): Area drains, storm water, and Condensate Storage Tank drains

b. Discharge Occurs: -- hrs/day; -- days/wk; 12 days/yr; -- months/yr

During which months? _____

For continuous discharges report:

The average discharge rate associated with the month of maximum production.	N/A	MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate	0.0083	MGD *
The maximum daily discharge rate	0.019	MGD **

*Estimated from Outfall 077
**Design flow

SECTION C (continued) NPDES Number PA 0047325

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters. N/A

Rainfall (inches)		Drainage Area Size	Units		Conversion Factor		Volume	Units
_____	X	_____	Ft^2	X	0.623	=		Gallons
_____	X	_____	Yd^2	X	5.61	=		Gallons
_____	X	_____	Acres	X	27.152	=		Gallons

III. REQUIRED AND OPTIONAL ANALYSES

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table should be used to report intake water quality, upstream background or ambient water quality, and parameter specific coefficient of effluent variability. Space is provided at the top of the table to provide description of sampling points used.)

Optional Toxics Data is attached to Application ☐ YES ☒ NO

SECTION C (continued) NPDES Number PA 0047325

II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 079

1. Process Wastewater (Sewage Treatment Plant)

a. Describe process and type of wastewater: N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

Process Wastewater

a. Describe process and type of wastewater: N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD

SECTION C (continued) NPDES Number PA 0047325

For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

II. SOURCES OF WASTEWATER FOR OUTFALL 079

2. Other Wastewater Contributing to this Outfall See No. 3 Below

(Description) _____

a. Source(s):

b. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr

During which months? _____

For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD

For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge flow rate _____ GPM

3. Total Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater

a. Source(s): Sanitary Wastes

b. Discharge Occurs: 24 hrs/day; 7 days/wk; 365 days/yr; 12 months/yr

During which months? All months

For continuous discharges report:
The average discharge rate associated with the month of maximum production. 0.0280 MGD*

For intermittent or seasonal discharges report:
The long-term average discharge rate N/A MGD
The maximum daily discharge rate N/A MGD

*Average discharge rate from March 1993, month of highest electrical production in 1993.

SECTION C (continued) NPDES Number PA 0047325

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters. N/A

Rainfall (inches)		Drainage Area Size	Units		Conversion Factor		Volume	Units
_____	X	_____	Ft^2	X	0.623	=		Gallons
_____	X	_____	Yd^2	X	5.61	=		Gallons
_____	X	_____	Acres	X	27.152	=		Gallons

III. REQUIRED AND OPTIONAL ANALYSES

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table should be used to report intake water quality, upstream background or ambient water quality, and parameter specific coefficient of effluent variability. Space is provided at the top of the table to provide description of sampling points used.)

Optional Toxics Data is attached to Application ☐ YES ☒ NO

SECTION C (continued) NPDES Number PA 0047325

II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 080 (C-1 Pond)

1. Process Wastewater N/A

a. Describe process and type of wastewater:

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD
For batch discharges report:
No. of decant cycles _____ CYCLES/DAY
Length of each decant cycle _____ MIN.
Average decant discharge rate _____ GPM

Process Wastewater N/A

a. Describe process and type of wastewater:

b. Applicable EPA Effluent Limitation Guideline: 40 CFR _____
Category/Subcategory _____

c. Maximum Monthly Production Rate:

Quantity	Units of Measure	Of Product (or raw material used)	Month When Representative Production Occurs	Days/Month Production Occurs

d. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months? _____
For continuous discharges report:
The average discharge rate associated with the month of maximum production. _____ MGD
For intermittent or seasonal discharges report:
The long-term average discharge rate _____ MGD
The maximum daily discharge rate _____ MGD

SECTION C (continued) NPDES Number PA 0047325

For batch discharges report:

No. of decant cycles	_____ CYCLES/DAY
Length of each decant cycle	_____ MIN.
Average decant discharge rate	_____ GPM

II. SOURCES OF WASTEWATER FOR OUTFALL 080

2. Other Wastewater Contributing to this Outfall See No. 3 Below

(Description) _____

a. Source(s):

b. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr

During which months? _____

For continuous discharges report:

The average discharge rate associated with the month of maximum production. _____ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate	_____ MGD
The maximum daily discharge rate	_____ MGD

For batch discharges report:

No. of decant cycles	_____ CYCLES/DAY
Length of each decant cycle	_____ MIN.
Average decant discharge flow rate	_____ GPM

3. Total Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater

a. Source(s): Runoff from paved roads, roof drains

b. Discharge Occurs: _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr

During which months? Rain dependent

For continuous discharges report:

The average discharge rate associated with the month of maximum production. _____ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate	_____ MGD
The maximum daily discharge rate	_____ MGD

SECTION C (continued) NPDES Number PA 0047325

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters.

Rainfall (inches)		Drainage Area Size	Units		Conversion Factor		Volume	Units
	X		Ft^2	X	0.623	=		Gallons
4.7	X	1.6×10^5	Yd^2	X	5.61	=	4.2×10^6	Gallons
	X		Acres	X	27.152	=		Gallons

III. REQUIRED AND OPTIONAL ANALYSES

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table should be used to report intake water quality, upstream background or ambient water quality, and parameter specific coefficient of effluent variability. Space is provided at the top of the table to provide description of sampling points used.)

Optional Toxics Data is attached to Application ☐ YES ☒ NO

SECTION C (continued) NPDES Number PA · 0047325

III. REQUIRED AND OPTIONAL ANALYSES

2. Summary of Required Analyses Worksheet

****** ALL DISCHARGERS SUBMIT THIS WORKSHEET WITH YOUR APPLICATION ******

Outfall Number	Discharge Contains (see Instructions for Section C, Part II)				GW Cleanup	Storm-water	Pollutants or Pollutant Groupings which must be Sampled for and Analyzed	Required No. of Sample Events. (see C.III)
	Process Waste	NCCW	Sanitary Waste	Misc. Waste				
070				Note 5		X	See Note 1	--
071	X						Groups 1,2,3,4,5,7,8	3
072				X			2C,3C,4C,5C,7C,12C,	1
							16C, 18M	
073				X			See Note 2	--
074				X			2C,3C,4C,5C,7C, 12C	1
							16C	
075				Note 5		X	See Note 1	--
077				X			4C,7C,12C	
078				X			See Note 3	--
079			X				1C,4C,6C,9C,11C,12C	1
							14C, 16C, 18C	
080				Note 5		X	1C,2C,4C,6C,7C,9C,12C	1
							14C,16C,18C,Note 4, Note 1	
Intak	X						Groups 1,2,3,4,5,7,8	1
Notes:	1) Outfalls 070, 075, and 080 are similar							
	2) Outfalls 073 and 074 are similar							
	3) Outfalls 077 and 078 are similar							
	4) Total Kjeldahl Nitrogen sampled							
	5) See Section C-I for additional information							

****** SUBMIT THIS TABLE WITH YOUR APPLICATION ******

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☐ Outfall Number _____
- ☒ Intake Sampling Results - Optional (Specify Source Susquehanna River)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	1. POLLUTANT GROUP 1	2. LEVEL PRESENT							3. UNITS		4. Coefficient of Effluent Variability (CV)
		a. Maximum Daily Value		b. Maximum 30 Day Value (if available)		c. Long Term Avge. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	
		(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
1C	Biochemical Oxygen Demand, BOD	8.35	N/A					1	mg/l	N/A	
2C	Chemical Oxygen Demand, COD	10.9									
3C	Total Organic Carbon, TOC	3									
4C	Total Suspended Solids, TSS	18.2									
5C	Total Dissolved Solids, TDS	109									
6C	Ammonia as N	<0.10									
7C	Oil and Grease	2									
8C	Bromide	<2									
9C	Chlorine, Total Residual	<0.10									
10C	Temperature winter	12.5 Value		Value		6.4 Value		6	(°C)	(°C)	(°C)
11C	Temperature summer	25.0 Value		Value		23.1 Value		5	(°C)	(°C)	(°C)
12C	pH	6.6 Minimum	8.5 Maximum					11	standard units	standard units	

2.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
2.b Maximum 30 Day Value - Determine the average of all daily values during each calendar month and report the highest average.
2.c Long Term Average Value - The average of all values within the last year and report both mass and concentration.
2.d Minimum of three sampling events required for process wastewater discharges and a minimum of one sampling event for all other discharges, treatment facility influent and intake water.

SECTION C (continued) NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☐ Outfall Number _____
- ☒ Intake Sampling Results - Optional (Specify Source Susquehanna River)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 2	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
13C	Color			110.2	17	N/A			1	Pt-Co	N/A								
14C	Fecal Coliform			9222D	875					#/100ml									
15C	Fluoride	100	100	340.2	<0.10					mg/l									
16C	Nitrate-Nitrite (as N)			353.2	0.8														
17C	Nitrogen, Total Organic (as N)			Calc.	1.22														
18C	Phosphorus (as P), Total			365.1	<0.10														
19C	Sulfate (as SO_4)	1,000	1000	375.4	13.6														
20C	Sulfide (as S)	1,000	1000	376.1	<1														
21C	Sulfite (as SO_3)	2,000	1000	377.1	<1														
22C	Surfactants (MBAS)	25	10	425.1	<0.01														

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☐ Outfall Number _____
- ☒ Intake Sampling Results - Optional (Specify Source Susquehanna River)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 2 (continued)	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
1M	Antimony, Total	200	20	200.7	<20	N/A			1	ug/l	N/A								
2M	Arsenic, Total	50	10	200.7	<10														
3M	Beryllium, Total	5	0.2	200.7	<0.2														
4M	Cadmium, Total	5	0.8	200.7	<0.8														
5M	Chromium, Total	50	1	200.7	<3														
5M	Chromium, Hexavalent	10	1	218.4	<2														
6M	Copper, Total	20	4	200.7	6														
7M	Lead, Total	100	7	200.7	<4														
8M	Mercury, Total	0.2	0.2	245.1	<0.2														
9M	Nickel, Total	40	2	200.7	<3														
10M	Selenium, Total	75	20	200.7	19														
11M	Silver, Total	10	1	200.7	<1														
12M	Thallium, Total	100	1	200.7	<1														
13M	Zinc, Total	5	5	200.7	36														
14M	Cyanide, Total	20	5	45CNC/E	<5														
14M	Cyanide, Free	5	5	412H	<5														

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

SECTION C (continued)

NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☐ Outfall Number _____
- ☒ Intake Sampling Results - Optional (Specify Source Susquehanna River _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 2 (continued)	Accept-able Detec-tion Level** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manu-factured	Stored	Inter-mediate Product	By-Product	Intake Water	Other (Explain)
					Concen-tration	Mass	Concen-tration	Mass		Concen-tration	Mass								
16M	Phenols, Total	5	5	420.2	<5	N/A			1	ug/l	N/A								
16M	Aluminum, Total	100	40	200.7	427														
17M	Barium, Total	100	0.3	200.7	25														
18M	Boron, Total	100	10	200.7	7														
19M	Cobalt, Total	50	2	200.7	<2														
20M	Iron, Total	30	2	200.7	1050														
21M	Iron, Dissolved	30	2	200.7	199														
22M	Magnesium, Total	30	20	200.7	2780														
23M	Molybdenum, Total	100	5	200.7	<5														
24M	Manganese, Total	10	0.3	200.7	59														
25M	Tin, Total	800	6	282.1	<3														
26M	Titanium, Total	400	200	283.1	<200														

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☐ Outfall Number _____
- ☒ Intake Sampling Results - Optional (Specify Source Susquehanna River :)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 3 Volatile Organics	Acceptable Detection Level** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present a. Max Daily Value Concentration	3. Level Present a. Max Daily Value Mass	3. Level Present b. Average of Analyses Concentration	3. Level Present b. Average of Analyses Mass	3. Level Present c. Number of Analysis	4. Units Concentration	4. Units Mass	5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
1V	Acrolein	10	10	603	<10	N/A			1	ug/l	N/A									
2V	Acrylonitrile	10	5	603	<10															
3V	Benzene	10	5	624	<5															
5V	Bromoform	10	5	624	<5															
6V	Carbon Tetrachloride	10	5	624	<5															
7V	Chlorobenzene	10	5	624	<5															
8V	Chlorodibromomethane	10	5	624	<5															
9V	Chloroethane	10	10	624	<10															
10V	2-Chloroethylvinyl Ether	10	10	624	<10															
11V	Chloroform	10	5	624	<5															
12V	Dichlorobromomethane	10	5	624	<5															
14V	1,1-Dichloroethane	10	5	624	<5															
15V	1,2-Dichloroethane	10	5	624	<5															
16V	1,1-Dichloroethylene	10	5	624	<5															
17V	1,2 Dichloropropane	10	5	624	<5															
18V	1,3-Dichloropropylene	10	5	624	<5															
19V	Ethylbenzene	10	5	624	<5															

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.
** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

SECTION C (continued) NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☐ Outfall Number _____
- ☒ Intake Sampling Results - Optional (Specify Source Susquehanna River)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 3 Volatile Organics (continued)	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present a. Max Daily Value Concentration	3. Level Present a. Max Daily Value Mass	3. Level Present b. Average of Analyses Concentration	3. Level Present b. Average of Analyses Mass	3. Level Present c. Number of Analysis	4. Units Concentration	4. Units Mass	5. Coefficient of Effluent Variability (CV)	6. Raw Material	6. Manufactured	6. Stored	6. Intermediate Product	6. By-Product	6. Intake Water	6. Other (Explain)
20V	Methyl Bromide	10	10	624	<10	N/A			1	ug/l	N/A								
21V	Methyl Chloride	10	5	624	< 5														
22V	Methylene Chloride	10	5	624	<5														
23V	1,1,2,2-Tetrachloroethane	10	5	624	<5														
24V	Tetrachloroethylene	10	5	624	<5														
25V	Toluene	10	5	624	<5														
26V	1,2-Trans-Dichloroethylene	10	5	624	<5														
27V	1,1,1-Trichloroethane	10	5	624	<5														
28V	1,1,2-Trichloroethane	10	5	624	<5														
29V	Trichloroethylene	10	5	624	<5														
31V	Vinyl Chloride	10	10	624	<10														

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☐ Outfall Number _____
- ☒ Intake Sampling Results - Optional (Specify Source Susquehanna River)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 4 Acid-Fraction Organics	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
1A	2-Chlorophenol	10	5	625	<5	N/A			1	ug/l	N/A								
2A	2,4-Dichlorophenol	10	5	625	<5														
3A	2,4-Dimethylphenol	10	5	625	<5														
4A	4,6-Dinitro-o-Cresol	10	25	625	<25														
5A	2,4-Dinitrophenol	50	25	625	<25														
6A	2-Nitrophenol	10	5	625	<5														
7A	4-Nitrophenol	50	25	625	<25														
8A	P-Chloro-m-Cresol	10	5	625	<5														
9A	Pentachlorophenol	50	25	625	<25														
10A	Phenol	10	5	625	<5														
11A	2,4,6-Trichlorophenol	10	5	625	<5														

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☐ Outfall Number _____
- ☒ Intake Sampling Results - Optional (Specify Source Susquehanna River)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 5 Base-Neutral Fraction Organics	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
1B	Acenaphthene	10	5	625	<5	N/A			1	ug/l	N/A								
2B	Acenaphthylene	10	5	625	<5														
3B	Anthracene	10	5	625	<5														
4B	Benzidine	50	25	625	< 25														
5B	Benzo (a) Anthracene	10	5	625	<5														
6B	Benzo (a) Pyrene	10	5	625	<5														
7B	3,4-Benzo-fluoranthene	10	5	625	<5														
8B	Benzo (*ghi*) Perylene	10	5	625	<5														
9B	Benzo (*k*) Fluoranthene	10	5	625	<5														
10B	Bis (2-*Chloro-ethoxy*) Methane	10	5	625	<5														
11B	Bis (2-*Chloro-ethyl*) Ether	10	5	625	<5														
12B	Bis (2-*Chloro-isopropyl*) Ether	10	5	625	<5														
13B	Bis (2-*Ethyl-hexyl*) Phthalate	10	5	625	<5														
14B	4-Bromophenyl Phenyl Ether	10	5	625	<5														

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in [redacted] applicant's interest to achieve a level of detection at least equal to (or preferably [redacted] sensitive than) those listed. This will minimize uncertainty and therefore the [redacted] or additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☐ Outfall Number _____
- ☒ Intake Sampling Results - Optional (Specify Source Susquehanna River)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 5 Base-Neutral Fraction Organics	Acceptable Detection Level** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present a. Max Daily Value Concentration	3. Level Present a. Max Daily Value Mass	3. Level Present b. Average of Analyses Concentration	3. Level Present b. Average of Analyses Mass	3. Level Present c. Number of Analysis	4. Units Concentration	4. Units Mass	5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
15B	Butyl Benzyl Phthalate	10	5	625	<5	N/A			1	ug/l	N/A								
16B	2-Chloronaphthalene	10	5	625	<5														
17B	4-Chlorophenyl Phenyl Ether	10	5	625	<5														
18B	Chrysene	10	5	625	<5														
19B	Dibenzo(a,h) Anthracene	10	5	625	<5														
20B	1,2-Dichlorobenzene	10	5	625	<5														
21B	1,3-Dichlorobenzene	10	5	625	<5														
22B	1,4-Dichlorobenzene	10	5	625	<5														
23B	3,3'-Dichloro-benzidine	50	10	625	<10														
24B	Diethyl Phthalate	20	5	625	<5														
25B	Dimethyl Phthalate	20	5	625	<5														
26B	Di-N-Butyl Phthalate	20	5	625	<5														
27B	2,4-Dinitrotoluene	10	5	625	<5														
28B	2,6-Dinitrotoluene	10	5	625	<5														
29B	Di-N-Octyl Phthalate	20	5	625	<5														
30B	1,2-Diphenylhydra-zine (as Azobenzene)	10	5	625	<5														

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.
** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☐ Outfall Number _____
- ☒ Intake Sampling Results - Optional (Specify Source Susquehanna River)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 5 Base-Neutral Fraction Organics	Acceptable Detection Level** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present a. Max Daily Value Concentration	3. Level Present a. Max Daily Value Mass	3. Level Present b. Average of Analyses Concentration	3. Level Present b. Average of Analyses Mass	3. Level Present c. Number of Analysis	4. Units Concentration	4. Units Mass	5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
31B	Fluoranthene	10	5	625	<5	N/A			1	ug/l	N/A								
32B	Fluorene	10																	
33B	Hexachlorobenzene	10																	
34B	Hexachlorobutadiene	10																	
35B	Hexachlorocyclopentadiene	10																	
36B	Hexachloroethane	10																	
37B	Indeno (1,2,3-cd) Pyrene	10																	
38B	Isophorone	10																	
39B	Naphthalene	10																	
40B	Nitrobenzene	10																	
41B	N-Nitrosodimethylamine	20																	
42B	N-Nitrosodi-N-Propylamine	20																	
43B	N-Nitrosodiphenylamine	20																	
44B	Phenanthrene	10																	
45B	Pyrene	10																	
46B	1,2,4-Trichlorobenzene	10																	

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in [illegible] applicant's interest to achieve a level of detection at least equal to (or preferably [illegible] sensitive than) those listed. This will minimize uncertainty and therefore the n[illegible]r additi[illegible] analyses or the potential for establishing a large number of effluent limits and/or [illegible]nitoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results N/A

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☐ Outfall Number _____
- ☒ Intake Sampling Results - Optional (Specify Source Susquehanna River)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 6 Pesticides	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
1P	Aldrin	10																	
2P	Alpha BHC	10																	
3P	Beta BHC	10																	
4P	Gamma BHC	10																	
5P	Delta BHC	10																	
6P	Chlordane	10																	
7P	4,4'-DDT	10																	
8P	4,4'-DDE	10																	
9P	4,4'-DDD	10																	
10P	Dieldrin	10																	
11P	Alpha-Endosulfan	10																	
12P	Beta-Endosulfan	10																	
13P	Endosulfan Sulfate	10																	
14P	Endrin	10																	
15P	Endrin Aldehyde	10																	
16P	Heptachlor	10																	
17P	Heptachlor Epoxide	10																	
25P	Toxaphene	10																	
26P	DIOXIN: 2,3,7,8-Tetrachlorodibenzo-P Dioxin																		

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.
** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

SECTION C (continued)

NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☐ Outfall Number _____
- ☒ Intake Sampling Results - Optional (Specify Source Susquehanna River)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 7 PCB's	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
18P	PCB-1242	20	0.1	608	0.1	N/A			1	ug/l	N/A								
19P	PCB-1254	20	0.2	608	0.2	↓			↓	↓	↓								
20P	PCB-1221	20	0.1	608	0.1														
21P	PCB-1232	20	0.1	608	0.1														
22P	PCB-1248	20	0.1	608	0.1														
23P	PCB-1260	20	0.2	608	0.2														
24P	PCB-1016	20	0.1	608	0.1	↓			↓	↓	↓								

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☐ Outfall Number _____
- ☒ Intake Sampling Results - Optional (Specify Source Susquehanna River)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 8 Radioactivity	Acceptable Detection Level** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present a. Max Daily Value Concentration	3. Level Present a. Max Daily Value Mass	3. Level Present b. Average of Analyses Concentration	3. Level Present b. Average of Analyses Mass	3. Level Present c. Number of Analysis	4. Units Concentration	4. Units Mass	5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
1R	Radioactivity: (1) Alpha, Total	Not Available		Note 1	<0.7	N/A			1	pCi/l	N/A								
2R	(2) Beta, Total	" "		Note 1	2.9± .8	N/A			1	pCi/l	N/A								
3R	(3) Radium, Total	" "		Note 1	< 1	N/A			1	pCi/l	N/A								
4R	(4) Radium 226, Total	" "		Note 1	< 0.3	N/A			1	pCi/l	N/A								

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

Note 1- Procedures used are from Teledyne Isotopes. See attached procedures.

SECTION C (continued) NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results Av. Discharge 4.76 MGD

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 071, Cooling Tower Blowdown
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	1. POLLUTANT GROUP 1	2. LEVEL PRESENT							3. UNITS		4. Coefficient of Effluent Variability (CV)
		a. Maximum Daily Value		b. Maximum 30 Day Value (if available)		c. Long Term Avge. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	
		(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
1C	Biochemical Oxygen Demand, BOD	5.40	261.12			4.76	199.16	3	mg/l	lbs/d	
2C	Chemical Oxygen Demand, COD	52.5	1050.40			39.37	1423.51	3	mg/l	lbs/d	
3C	Total Organic Carbon, TOC	10.0	500.65			10.0	394.76	3	mg/l	lbs/d	
4C	Total Suspended Solids, TSS	99.0	1980.76			54.67	1724.88	3	mg/l	lbs/d	
5C	Total Dissolved Solids, TDS	484	24231.5			395.67	15666.5	3	mg/l	lbs/d	
6C	Ammonia as N	<0.1	5.01			<0.1	<3.95	3	mg/l	lbs/d	
7C	Oil and Grease	<2	<100.13			<2	<78.95	3	mg/l	lbs/d	
8C	Bromide	<2	<100.13			<2	<78.95	3	mg/l	lbs/d	
9C	Chlorine, Total Residual	<0.1	<5.01			<0.1	<3.95	3	mg/l	lbs	
10C	Temperature winter	24 Value			Value	16.25 Value		6	(°C)	(°C)	(°C)
11C	Temperature summer	30 Value			Value	26.6 Value		5	(°C)	(°C)	(°C)
12C	pH	7.9 Minimum	9.0 Maximum					11	standard units	standard units	

2.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
2.b Maximum 30 Day Value - Determine the average of all daily values during each calendar month and report the highest average.
2.c Long Term Average Value - The average of all values within the last year and report both mass and concentration.
2.d Minimum of three sampling events required for process wastewater discharges and a minimum of one sampling event for all other discharges, treatment facility influent and intake water.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)

☒ Outfall Number 071, Cooling Tower Blowdown

☐ Intake Sampling Results - Optional (Specify Source _____)

☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)

☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)

☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 2	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
13C	Color			110.2	56	N/A	45.33	N/A	3	Pt-Co.	N/A								
14C	Fecal Coliform			9222D	1275	N/A	927.3	N/A	3	#/100ml	N/A								
15C	Fluoride	100	100	340.2	0.29	14.52	0.22	8.75	3	mg/l	lbs/d								
16C	Nitrate-Nitrite (as N)			353.2	4.3	215.28	3.77	149.63	3	mg/l	lbs/d								
17C	Nitrogen, Total Organic (as N)			CALC.	2.37	47.42	2.01	75.75	3	mg/l	lbs/d								
18C	Phosphorus (as P), Total			365.1	0.63	30.46	0.61	24.13	3	mg/l	lbs/d								
19C	Sulfate (as SO_4)	1,000	1000	375.4	126	2521	104.07	3898.6	3	mg/l	lbs/d								
20C	Sulfide (as S)	1,000	1000	376.1	<1.0	<50.06	<1.0	<39.48	3	mg/l	lbs/d								
21C	Sulfite (as SO_3)	2,000	1000	377.1	<1.0	<50.06	<1.0	<39.48	3	mg/l	lbs/d								
22C	Surfactants (MBAS)	25	10	425.1	0.02	1.00	0.017	0.72	3	mg/l	lbs/d								

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 071, Cooling Tower Blowdown
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 2 (continued)	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis	Concentration	Mass		Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass											
1M	Antimony, Total	200	20	200.7	<20	<1.0	<20	<0.79	3	ug/l	lbs/d								
2M	Arsenic, Total	50	20	200.7	65	1.30	28	0.76	3	ug/l	lbs/d								
3M	Beryllium, Total	5	0.2	200.7	<0.2	<0.01	<0.2	<0.01	3	ug/l	lbs/d								
4M	Cadmium, Total	5	1	200.7	3	0.06	1.5	<0.05	3	ug/l	lbs/d								
5M	Chromium, Total	50	1	200.7	6	0.12	<4	0.14	3	ug/l	lbs/d								
5M	Chromium, Hexavalent	10	2	218.4	<2	<0.10	<2	<0.08	3	ug/l	lbs/d								
6M	Copper, Total	20	4	200.7	13	0.26	11	0.41	3	ug/l	lbs/d								
7M	Lead, Total	100	7	200.7	35	0.70	16	0.45	3	ug/l	lbs/d								
8M	Mercury, Total	0.2	0.20	245.1	5	0.10	1.8	<0.04	3	ug/l	lbs/d								
9M	Nickel, Total	40	2	200.7	12	0.24	10	0.37	3	ug/l	lbs/d								
10M	Selenium, Total	75	20	200.7	<20	<0.40	<13	<0.46	3	ug/l	lbs/d								
11M	Silver, Total	10	2	200.7	2	0.04	<1.3	<0.05	3	ug/l	lbs/d								
12M	Thallium, Total	100	1	200.9	<1	<0.05	<1	<0.04	3	ug/l	lbs/d								
13M	Zinc, Total	5	5	200.7	63	1.26	42	1.45	3	ug/l	lbs/d								
14M	Cyanide, Total	20	5	4500CN/E	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								
14M	Cyanide, Free	5	5	412H	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
☒ Outfall Number 071, Cooling Tower Blowdown
☐ Intake Sampling Results - Optional (Specify Source _____)
☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 2 (continued)	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present a. Max Daily Value Concentration	3. Level Present a. Max Daily Value Mass	3. Level Present b. Average of Analyses Concentration	3. Level Present b. Average of Analyses Mass	3. Level Present c. Number of Analysis	4. Units Concentration	4. Units Mass	5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
15M	Phenols, Total	5	5	420.2	42.0	0.84	20.67	0.61	3	ug/l	lbs/d								
16M	Aluminum, Total	100	40	200.7	2400	48.02	1280	39.7											
17M	Barium, Total	100	0.3	200.7	79	3.96	75	2.98											
18M	Boron, Total	100	10	200.7	51	1.02	<21	<0.60											
19M	Cobalt, Total	50	2	200.7	3	0.06	<2	<0.09											
20M	Iron, Total	30	2	200.7	4900	98.04	3000	99.6											
21M	Iron, Dissolved	30	2	200.7	410	19.83	360	14.08											
22M	Magnesium, Total	30	20	200.7	16200	811.05	14070	557.14											
23M	Molybdenum, Total	100	5	200.7	6	0.12	<5	<0.20											
24M	Manganese, Total	10	0.3	200.7	250	5.00	189	6.88											
25M	Tin, Total	800	6	282.1	26	0.52	<11	<0.27											
26M	Titanium, Total	400	200	283.1	<200	<10	<200	<7.89											

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.
** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

SECTION C (continued) NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 071, Cooling Tower Blowdown
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 3 Volatile Organics	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
1V	Acrolein	10	10	603	<10	<0.50	<10	<0.39	3	ug/l	lbs/d								
2V	Acrylonitrile	10	5	603	<10	<0.50	<10	<0.39	3	ug/l	lbs/d								
3V	Benzene	10	5	624	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								
5V	Bromoform	10	5	624	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								
6V	Carbon Tetrachloride	10	5	624	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								
7V	Chlorobenzene	10	5	624	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								
8V	Chlorodibromomethane	10	5	624	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								
9V	Chloroethane	10	10	624	<10	<0.50	<10	<0.39	3	ug/l	lbs/d								
10V	2-Chloroethylvinyl Ether	10	10	624	<10	<0.50	<10	<0.38	3	ug/l	lbs/d								
11V	Chloroform	10	5	624	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								
12V	Dichlorobromomethane	10	5	624	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								
14V	1,1-Dichloroethane	10	5	624	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								
15V	1,2-Dichloroethane	10	5	624	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								
16V	1,1-Dichloroethylene	10	5	624	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								
17V	1,2 Dichloropropane	10	5	624	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								
18V	1,3-Dichloropropylene	10	5	624	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								
19V	Ethylbenzene	10	5	624	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.
** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)

☒ Outfall Number 071, Cooling Tower Blowdown

☐ Intake Sampling Results - Optional (Specify Source _____)

☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)

☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)

☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 3 Volatile Organics (continued)	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present a. Max Daily Value Concentration	3. Level Present a. Max Daily Value Mass	3. Level Present b. Average of Analyses Concentration	3. Level Present b. Average of Analyses Mass	3. Level Present c. Number of Analysis	4. Units Concentration	4. Units Mass	5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
20V	Methyl Bromide	10	10	624	<10	<0.50	<10	<0.39	3	ug/l	lbs/d								
21V	Methyl Chloride	10	5	624	<10	<0.50	<8.34	<0.36	3	ug/l	lbs/d								
22V	Methylene Chloride	10	5	624	<5	<0.25	<5	<0.20	3	ug/l	lbs/d								
23V	1,1,2,2-Tetrachloroethane	10																	
24V	Tetrachloroethylene	10																	
25V	Toluene	10																	
26V	1,2-Trans-Dichloroethylene	10																	
27V	1,1,1-Trichloroethane	10																	
28V	1,1,2-Trichloroethane	10																	
29V	Trichloroethylene	10																	
31V	Vinyl Chloride	10	10	624	< 10	< 0.50	< 10	<0.39											

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 071, Cooling Tower Blowdown
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 4 Acid-Fraction Organics	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
1A	2-Chlorophenol	10	10	625	<6	<0.30	<5.34	<0.21	3	ug/l	lbs/d								
2A	2,4-Dichlorophenol	10	10	625	<6	<0.30	<5.34	<0.21											
3A	2,4-Dimethylphenol	10	10	625	<6	<0.30	<5.34	<0.21											
4A	4,6-Dinitro-o-Cresol	10	10	625	<30	<1.5	<26.67	<1.07											
5A	2,4-Dinitrophenol	50	30	625	<30	<1.5	<26.7	<1.07											
6A	2-Nitrophenol	10	6	625	<6	<0.30	<5.34	<0.21											
7A	4-Nitrophenol	50	30	625	<30	<1.5	<26.7	<1.07											
8A	P-Chloro-m-Cresol	10	6	625	<6	<0.30	<5.34	<0.21											
9A	Pentachlorophenol	50	30	625	<30	<1.50	<26.67	<1.07											
10A	Phenol	10	6	625	<6	<0.30	<5.34	<0.21											
11A	2,4,6-Trichlorophenol	10	6	625	<6	<0.30	<5.34	<0.21											

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

NPDES Number PA UU47325

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
☒ Outfall Number 071, Cooling Tower Blowdown
☐ Intake Sampling Results - Optional (Specify Source _____)
☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 5 Base-Neutral Fraction Organics	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present a. Max Daily Value Concentration	3. Level Present a. Max Daily Value Mass	3. Level Present b. Average of Analyses Concentration	3. Level Present b. Average of Analyses Mass	3. Level Present c. Number of Analysis	4. Units Concentration	4. Units Mass	5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
1B	Acenaphthene	10	6	625	<6	<0.30	<5.34	<0.21	3	ug/l	lbs/d									
2B	Acenaphthylene	10	6		<6	<0.30	<5.34	<0.21	3	ug/l	lbs/d									
3B	Anthracene	10	6		<6	<0.3	<5.34	<0.21												
4B	Benzidine	50	30		<30	<1.50	<26.7	<1.07												
5B	Benzo (a) Anthracene	10	6		<6	<0.30	<5.34	<0.21												
6B	Benzo (a) Pyrene	10																		
7B	3,4-Benzo-fluoranthene	10																		
8B	Benzo (ghi) Perylene	10																		
9B	Benzo (k) Fluoranthene	10																		
10B	Bis (2-Chloro-ethoxy) Methane	10																		
11B	Bis (2-Chloro-ethyl) Ether	10																		
12B	Bis (2-Chloro-isopropyl) Ether	10																		
13B	Bis (2-Ethyl-hexyl) Phthalate	10			23	0.46	11.67	0.35												
14B	4-Bromophenyl Phenyl Ether	10			<6	<0.30	<5.34	<0.21												

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c - A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.
** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

SECTION C (continued) NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 071, Cooling Tower Blowdown
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 5 Base-Neutral Fraction Organics	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present a. Max Daily Value Concentration	3. Level Present a. Max Daily Value Mass	3. Level Present b. Average of Analyses Concentration	3. Level Present b. Average of Analyses Mass	3. Level Present c. Number of Analysis	4. Units Concentration	4. Units Mass	5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
15B	Butyl Benzyl Phthalate	10	6	625	<6	<0.30	<5.34	<0.21	3	ug/l	lbs/d								
16B	2-Chloronaphthalene	10																	
17B	4-Chlorophenyl Phenyl Ether	10																	
18B	Chrysene	10																	
19B	Dibenzo(a,h) Anthracene	10																	
20B	1,2-Dichlorobenzene	10																	
21B	1,3-Dichlorobenzene	10																	
22B	1,4-Dichlorobenzene	10																	
23B	3,3'-Dichloro-benzidine	50	12		<12	<0.60	<10.7	<0.43											
24B	Diethyl Phthalate	20	6		<6	<0.30	<5.34	<0.21											
25B	Dimethyl Phthalate	20																	
26B	Di-N-Butyl Phthalate	20																	
27B	2,4-Dinitrotoluene	10																	
28B	2,6-Dinitrotoluene	10																	
29B	Di-N-Octyl Phthalate	20																	
30B	1,2-Diphenylhydrazine (as Azobenzene)	10																	

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.
** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analysis Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 071, Cooling Tower Blowdown
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 5 Base-Neutral Fraction Organics	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present a. Max Daily Value Concentration	3. Level Present a. Max Daily Value Mass	3. Level Present b. Average of Analyses Concentration	3. Level Present b. Average of Analyses Mass	3. Level Present c. Number of Analysis	4. Units Concentration	4. Units Mass	5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
31B	Fluoranthene	10	6	625	6	<0.30	<5.34	<0.21	3	ug/l	lbs/d									
32B	Fluorene	10																		
33B	Hexachlorobenzene	10																		
34B	Hexachlorobutadiene	10																		
35B	Hexachlorocyclopentadiene	10																		
36B	Hexachloroethane	10																		
37B	Indeno (1,2,3-cd) Pyrene	10																		
38B	Isophorone	10																		
39B	Naphthalene	10																		
40B	Nitrobenzene	10																		
41B	N-Nitrosodimethylamine	20																		
42B	N-Nitrosodi-N-Propylamine	20																		
43B	N-Nitrosodiphenylamine	20																		
44B	Phenanthrene	10																		
45B	Pyrene	10																		
46B	1,2,4-Trichlorobenzene	10																		

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

SECTION C (continued) NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES *

N/A

3. Analyses Results

☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)

☒ Outfall Number 071, Cooling Tower Blowdown

☐ Intake Sampling Results - Optional (Specify Source _____)

☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)

☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)

☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 6 Pesticides	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
1P	Aldrin	10																	
2P	Alpha BHC	10																	
3P	Beta BHC	10																	
4P	Gamma BHC	10																	
5P	Delta BHC	10																	
6P	Chlordane	10																	
7P	4,4'-DDT	10																	
8P	4,4'-DDE	10																	
9P	4,4'-DDD	10																	
10P	Dieldrin	10																	
11P	Alpha-Endosulfan	10																	
12P	Beta-Endosulfan	10																	
13P	Endosulfan Sulfate	10																	
14P	Endrin	10																	
15P	Endrin Aldehyde	10																	
16P	Heptachlor	10																	
17P	Heptachlor Epoxide	10																	
25P	Toxaphene	10																	
26P	DIOXIN: 2,3,7,8-Tetrachlorodibenzo-P Dioxin																		

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in [redacted]pplicant's interest to achieve a level of detection at least equal to (or preferably [redacted]ensitive than) those listed. This will minimize uncertainty and therefore the ne[redacted]r additi[redacted]nalyses or the potential for establishing a large number of effluent limits and/or [redacted]itoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analysis Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 071, Cooling Tower Blowdown
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 7 PCB's	Acceptable Detection Level** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
18P	PCB-1242	20	0.1	608	<0.1	<0.005	<0.1	<0.004	3	ug/l	lbs/d								
19P	PCB-1254	20	0.2	608	<0.2	<0.01	<0.02	<0.008	3	ug/l	lbs/d								
20P	PCB-1221	20	0.1	608	<0.1	<0.005	<0.1	<0.004	3	ug/l	lbs/d								
21P	PCB-1232	20	0.1	608	<0.1	<0.005	<0.1	<0.004	3	ug/l	lbs/d								
22P	PCB-1248	20	0.1	608	<0.1	<0.005	<0.1	<0.004	3	ug/l	lbs/d								
23P	PCB-1260	20	0.2	608	<0.2	<0.01	<0.2	<0.008	3	ug/l	lbs/d								
24P	PCB-1016	20	0.1	608	<0.1	<0.005	<0.1	<0.004	3	ug/l	lbs/d								

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 071, Cooling Tower Blowdown
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 8 Radioactivity	Acceptable Detection Level ** (pg/l)	1. Detection Level Used (pg/l)	2. EPA Method Number Used	3. Level Present a. Max Daily Value Concentration	3. Level Present a. Max Daily Value Mass	3. Level Present b. Average of Analyses Concentration	3. Level Present b. Average of Analyses Mass	3. Level Present c. Number of Analysis	4. Units Concentration	4. Units Mass	5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
	Radioactivity:																			
1R	(1) Alpha, Total	Not Available		Note 1	<2.0	N/A	<1.67	N/A	3	pCi/l	N/A									
2R	(2) Beta, Total	" "		Note 1	17	N/A	14	N/A	3	pCi/l	N/A									
3R	(3) Radium, Total	" "		Note 1	<3	N/A	<2.17	N/A	3	pCi/l	N/A									
4R	(4) Radium 226, Total	" "		Note 1	0.63	N/A	0.35	N/A	3	pCi/l	N/A									

3 If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

Note 1- Procedures used are from Teledyne Isotopes.

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results 0.0150 MGD

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 072, Service and Administration Building Sump
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	1. POLLUTANT GROUP 1	2. LEVEL PRESENT							3. UNITS		4. Coefficient of Effluent Variability (CV)
		a. Maximum Daily Value		b. Maximum 30 Day Value (if available)		c. Long Term Avgo. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	
		(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
1C	Biochemical Oxygen Demand, BOD										
2C	Chemical Oxygen Demand, COD	24.0	3.00					1	mg/l	lbs/d	
3C	Total Organic Carbon, TOC	3	0.38					1	mg/l	lbs/d	
4C	Total Suspended Solid, TSS	5.2	0.65					1	mg/l	lbs/d	
5C	Total Dissolved Solids TDS	137	17.14					1	mg/l	lbs/d	
6C	Ammonia as N										
7C	Oil and Grease	4	0.50					1	mg/l	lbs	
8C	Bromide										
9C	Chlorine, Total Residual										
10C	Temperature winter	Value		Value		Value			(°C)	(°C)	(°C)
11C	Temperature summer	Value		Value		Value			(°C)	(°C)	(°C)
12C	pH	Minimum 7.10	Maximum 8.5	XXX	XXX	XXX	XXX	8	standard units	standard units	

2.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
2.b Maximum 30 Day Value - Determine the average of all daily values during each calendar month and report the highest average.
2.c Long Term Average Value - The average of all values within the last year and report both mass and concentration.
2.d Minimum of three sampling events required for process wastewater discharges and a minimum of one sampling event for all other discharges, treatment facility influent and intake water.

SECTION C (continued)

NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 072, Service and Administration Building Sump
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 2	Acceptable Detection Level** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
13C	Color																		
14C	Fecal Coliform																		
15C	Fluoride	100																	
16C	Nitrate-Nitrite (as N)			353.2	0.7	0.09			1	mg/l	lbs/d								
17C	Nitrogen, Total Organic (as N)																		
18C	Phosphorus (as P), Total																		
19C	Sulfate (as SO_4)	1,000																	
20C	Sulfide (as S)	1,000																	
21C	Sulfite (as SO_3)	2,000																	
22C	Surfactants (MBAS)	25																	

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number -072, Service and Administration Building Sump
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 2 (continued)	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
15M	Phenols, Total	5																	
16M	Aluminum, Total	100																	
17M	Barium, Total	100																	
18M	Boron, Total	100	10	200.7	43	0.005			1	ug/l	lbs/d								
19M	Cobalt, Total	50																	
20M	Iron, Total	30																	
21M	Iron, Dissolved	30																	
22M	Magnesium, Total	30																	
23M	Molybdenum, Total	100																	
24M	Manganese, Total	10																	
25M	Tin, Total	800																	
26M	Titanium, Total	400																	

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

SECTION C (continued) NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results 0.0087 MGD

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 074, Unit 2 Turbine Building Sump
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	1. POLLUTANT GROUP 1	2. LEVEL PRESENT							3. UNITS		4. Coefficient of Effluent Variability (CV)
		a. Maximum Daily Value		b. Maximum 30 Day Value (if available)		c. Long Term Avge. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	
		(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
1C	Biochemical Oxygen Demand, BOD										
2C	Chemical Oxygen Demand, COD	13.1	0.95					1	mg/l	lbs/d	
3C	Total Organic Carbon, TOC	4	0.29					1	mg/l	lbs/d	
4C	Total Suspended Solids, TSS	2.6	0.19					1	mg/l	lbs/d	
5C	Total Dissolved Solids, TDS	267	19.37					1	mg/l	lbs/d	
6C	Ammonia as N										
7C	Oil and Grease	4	0.29					1	mg/l	lbs/d	
8C	Bromide										
9C	Chlorine, Total Residual										
10C	Temperature winter	Value		Value		Value			(°C)	(°C)	(°C)
11C	Temperature summer	Value		Value		Value			(°C)	(°C)	(°C)
12C	pH	Minimum 7.4	8.13 Maximum	X	X	X	X	5	standard units	standard units	

2.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
2.b Maximum 30 Day Value - Determine the average of all daily values during each calendar month and report the highest average.
2.c Long Term Average Value - The average of all values within the last year and report both mass and concentration.
2.d Minimum of three sampling events required for process wastewater discharges and a minimum of one sampling event for all other discharges, treatment facility influent and intake water.

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 074, Unit 2 Turbine Building Sump
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 2	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
13C	Color																		
14C	Fecal Coliform																		
15C	Fluoride	100																	
16C	Nitrate-Nitrite (as N)			353.2	0.3	0.02			1	mg/l	lbs/d								
17C	Nitrogen, Total Organic (as N)																		
18C	Phosphorus (as P), Total																		
19C	Sulfate (as SO_4)	1,000																	
20C	Sulfide (as S)	1,000																	
21C	Sulfite (as SO_3)	2,000																	
22C	Surfactants (MBAS)	25																	

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.
** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

SECTION C (continued) NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES 0.0083 MGD

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 077, Unit 1 Condensate Storage Tank Area.(Storm Water)
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	1. POLLUTANT GROUP I	2. LEVEL PRESENT							3. UNITS		4. Coefficient of Effluent Variability (CV)
		a. Maximum Daily Value		b. Maximum 30 Day Value (if available)		c. Long Term Avge. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	
		(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
1C	Biochemical Oxygen Demand, BOD										
2C	Chemical Oxygen Demand, COD										
3C	Total Organic Carbon, TOC										
4C	Total Suspended Solids, TSS	2.6	0.18					1	mg/l	lb/d	
5C	Total Dissolved Solids, TDS										
6C	Ammonia as N										
7C	Oil and Grease	0.70	0.048					1	mg/l	lb/d	
8C	Bromide										
9C	Chlorine, Total Residual										
10C	Temperature winter	Value		Value		Value			(°C)	(°C)	(°C)
11C	Temperature summer	Value		Value		Value			(°C)	(°C)	(°C)
12C	pH	7.15 Minimum	7.15 Maximum	X	X	X	X	1	standard units	standard units	

2.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
2.b Maximum 30 Day Value - Determine the average of all daily values during each calendar month and report the highest average.
2.c Long Term Average Value - The average of all values within the last year and report both mass and concentration.
2.d Minimum of three sampling events required for process wastewater discharges and a minimum of one sampling event for all other discharges, treatment facility influent and intake water.

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results 0.01985 MGD

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 079, Sewage Treatment Plant
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	1. POLLUTANT GROUP 1	2. LEVEL PRESENT							3. UNITS		4. Coefficient of Effluent Variability (CV)
		a. Maximum Daily Value		b. Maximum 30 Day Value (If available)		c. Long Term Avgo. Value (If available)		d. No. of Analyses	a. Concentration	b. Mass	
		(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
1C	Biochemical Oxygen Demand, BOD	16.2	2.68					1	mg/l	lbs/d	
2C	Chemical Oxygen Demand, COD										
3C	Total Organic Carbon, TOC										
4C	Total Suspended Solids, TSS	11.6	1.92					1	mg/l	lbs/d	
5C	Total Dissolved Solids, TDS										
6C	Ammonia as N	63.6	10.53					1	mg/l	lbs/d	
7C	Oil and Grease										
8C	Bromide										
9C	Chlorine, Total Residual	1.04	0.17					1	mg/l	lbs/d	
10C	Temperature winter	Value		Value		Value		0	(°C)	(°C)	(°C)
11C	Temperature summer	15.5 Value		Value		12.41 Value		24	(°C)	(°C)	(°C)
12C	pH	Minimum 7.35	Maximum 7.65					25	standard units	standard units	

2.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
2.b Maximum 30 Day Value - Determine the average of all daily values during each calendar month and report the highest average.
2.c Long Term Average Value - The average of all values within the last year and report both mass and concentration.
2.d Minimum of three sampling events required for process wastewater discharges and a minimum of one sampling event for all other discharges, treatment facility influent and intake water.

SECTION C (continued) NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 079, Sewage Treatment Plant
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 2	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
13C	Color																		
14C	Fecal Coliform			9222D	0	N/A			1	#/100ml	N/A								
15C	Fluoride	100																	
16C	Nitrate-Nitrite (as N)			353.2	1.7	0.27			1	mg/l	lbs/d								
17C	Nitrogen, Total Organic (as N)																		
18C	Phosphorus (as P), Total			365.1	8.02	1.33			1	mg/l	lbs/d								
19C	Sulfate (as SO_4)	1,000																	
20C	Sulfide (as S)	1,000																	
21C	Sulfite (as SO_3)	2,000																	
22C	Surfactants (MBAS)	25																	

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

SECTION C (continued) NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results 406 gallons per 150 min Rain Event (See Note)

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☒ Outfall Number 080, Stormwater Runoff
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	1. POLLUTANT GROUP 1	2. LEVEL PRESENT							3. UNITS		4. Coefficient of Effluent Variability (CV)
		a. Maximum Daily Value		b. Maximum 30 Day Value (if available)		c. Long Term Avgo. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	
		(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
1C	Biochemical Oxygen Demand, BOD	1.22	N/A					1	mg/l	N/A	
2C	Chemical Oxygen Demand, COD	12.3	N/A					1	mg/l	N/A	
3C	Total Organic Carbon, TOC										
4C	Total Suspended Solids, TSS	2.0	N/A					1	mg/l	N/A	
5C	Total Dissolved Solids, TDS										
6C	Ammonia as N	<0.10	N/A					1	mg/l	N/A	
7C	Oil and Grease	<2	N/A					1	mg/l	N/A	
8C	Bromide										
9C	Chlorine, Total Residual	< 0.10	N/A					1	mg/l	N/A	
10C	Temperature winter	Value		Value		Value			(°C)	(°C)	(°C)
11C	Temperature summer	Value		Value		Value			(°C)	(°C)	(°C)
12C	pH	Minimum	Maximum						standard units	standard units	

2.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
2.b Maximum 30 Day Value - Determine the average of all daily values during each calendar month and report the highest average.
2.c Long Term Average Value - The average of all values within the last year and report both mass and concentration.
2.d Minimum of three sampling events required for process wastewater discharges and a minimum of one sampling event for all other discharges, treatment facility influent and intake water.

Note - Max flow 5.2 gpm above background during 3-hour sampling period; 0.14" of rain, greater than 72 hours since last rain event; 3-hour composite samples for all parameters except oil and grease, pH, and fecal coliforms.

SECTION C (continued)

NPDES Number PA 0047325

III. REQUIRED AND OPTIONAL ANALYSES *

3. Analyses Results

- ☐ Outfall Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10)
- ☑ Outfall Number 080, Stormwater Runoff
- ☐ Intake Sampling Results - Optional (Specify Source _____)
- ☐ Upstream Background Sample Results - Optional (Specify Location of Sample _____)
- ☐ Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 _____)
- ☐ New Discharge (Describe basis for information presented, see Instructions for Section C, Part II _____)

	Pollutant Group 2	Acceptable Detection Level ** (µg/l)	1. Detection Level Used (µg/l)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)	6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason.						
					a. Max Daily Value		b. Average of Analyses		c. Number of Analysis				Raw Material	Manufactured	Stored	Intermediate Product	By-Product	Intake Water	Other (Explain)
					Concentration	Mass	Concentration	Mass		Concentration	Mass								
13C	Color																		
14C	Fecal Coliform			9222D	6	N/A	6	N/A	2	#/100ml	(See	Note)							
15C	Fluoride	100																	
16C	Nitrate-Nitrite (as N)			353.2	2.0	N/A			1	mg/l	N/A								
17C	Nitrogen, Total Organic (as N)																		
18C	Phosphorus (as P), Total			365.1	<0.10	N/A			1	mg/l	N/A								
19C	Sulfate (as SO_4)	1,000																	
20C	Sulfide (as S)	1,000																	
21C	Sulfite (as SO_3)	2,000																	
22C	Surfactants (MBAS)	25																	

3. If other data is available (i.e. DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b Average of Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

* Make copies of this table and check appropriate box.

** It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

Note - A second fecal coliform sample was taken since first sample analysis began after six hours, exceeding procedure holding time.

GROSS ALPHA AND GROSS BETA RADIOACTIVITY IN WATER (TOTAL, SUSPENDED AND DISSOLVED)

INTRODUCTION

This procedure is required for environmental water samples analyzed under certification by the State of New Jersey Department of Environmental Protection.

Steps in the procedure listed below are taken directly from their source, The Standards Methods for the Examination of Water and Wastewater, 13th Edition. Notes listed under the steps were written at Teledyne Isotopes to assist the analyst.

4a. PROCEDURE FOR GROSS ALPHA AND GROSS BETA ACTIVITY

1) For each 20 sq cm of counting pan area, take a volume of sample containing not more than 200 mg of residue for beta examination and not more than 100 mg of residue for alpha examination. The specific conductance test helps to select the appropriate sample volume.

   NOTE: The 2-inch diameter stainless steel planchet used for this analysis (stamped with a concentric ring pattern) has a counting pan area near 20 sq. cm. Therefore, sample volumes containing not more than 200 mg of residue for beta analysis and not more than 100 mg of residue for alpha analysis are required. A conductivity test of the sample, expressed in mg total dissolved solids (TDS) per liter, will indicate the approximate aliquot size which will meet these limits.

2) Evaporate by either of the following technics:

   (a) Add the sample directly to a tared counting pan in small increments, with evaporation just below boiling temperature.

Issue or Revision	Pages	Prepared By	Effective Date	Approved By Vice President Technical	Approved By Manager Quality Assurance
Issue	5		04/18/88		

H. Jeter
H. W. Jeter

J. D. Martin
J. D. Martin

B. I. Campbell
B. I. Campbell

(b) Place the sample in a pyrex beaker or evaporating dish, add a few drops of methyl orange indicator solution, add 1N HCl or 1N HNO_3 dropwise to pH 4-6, and evaporate on a hot plate or steam bath to near dryness. Avoid baking solids on the evaporation vessel. Transfer the residue to a tared counting pan with the aid of a rubber policeman and distilled water from a wash bottle. Thoroughly wet the walls of the evaporating vessel with a few drops of acid by means of a rubber policeman and transfer the acid washings to the counting pan. (Excess alkalinity or mineral acidity is corrosive to aluminum counting pans.)

NOTE: Evaporation method (b) is preferred. Use 1N HNO_3 (not HCl) in order to avoid corrosion of planchets.

3) Complete the drying in an oven at 103-105 C, cool in a dessicator, weigh, and keep the sample dry until counted.

NOTES: (a) The initial drying may be performed under heat lamps if the drying is completed in an oven at 103-105°C. Use fiber trays to hold planchets. The trays fit into the special dessicator made for these samples.

(b) Record sample numbers, customer name, sample type, aliquot used, tare weights, final weights, residue weights, date of analysis and analysts's initials in the laboratory data book as described in PRO-032-1. Also complete a data sheet for each group of samples as described in that procedure.

(c) Instructions 4 and 5 from procedure 302 are not reproduced here because they apply to internal counters rather than window counters.

6) Store sample in a desiccator and count for decay if necessary. Avoid heat treatment if ingrowth of gaseous daughter products is suspected.

NOTE: Store counted samples in the special dessicator for several days until the analysis results have been calculated and approved. Recounting may be performed to verify activity or to obtain greater analytical sensitivity. Recounting for decay is generally not performed for gross alpha and beta analyses.

4b. <u>PROCEDURE FOR GROSS ALPHA AND GROSS BETA OF DISSOLVED MATTER</u>

1) Proceed as in 4a(1) above with a sample volume containing the requisite maximum weight of dissolved matter.

2) Filter through a Gooch crucible or, if the suspended matter is to be examined, a membrane filter.

NOTE: The membrane filter is preferred (millipore 0.45 um).

3) Process the filter as described in 4a(2)-(6) above, and report the dissolved alpha activity and dissolved beta activity by Gooch or by membrane filtration as the case may be.

4c. PROCEDURE FOR GROSS ALPHA AND GROSS BETA OF SUSPENDED MATTER

1) For each 10 sq cm of membrane filter area, take a volume of sample not to exceed 50 mg of suspended matter for alpha assay and not to exceed 100 mg for beta assay.

NOTES: (a) The filter area on the millipore apparatus is approximately 10 sq cm. Therefore, the filtrate mass must not exceed 50 mg for alpha or 100 mg for beta.

(b) Shake the sample container to distribute particulate matter uniformly before decanting aliquot. Trial-and-error may be required to find an aliquot which meets the suspended mass requirements.

(c) Obtain and record tare weight of membrane filter in planchet before filtration (see PRO-032-41).

2) Filter sample through the membrane filter with suction; then wash sides of filter funnel with a few milliliters of distilled water.

3) Transfer filter to a tared counting pan and oven-dry.

NOTES: (a) Use fiber trays to hold planchets.

(b) Instruction 4 of the procedure is omitted because it applies to internal counters rather than window counters.

5) Cool, weigh, and count at the alpha and the beta plateaus.

NOTE: Record sample information and weights in the laboratory notebook and on a data sheet. See note (b) under procedure 4a(3) above.

6) If sample particles tend to be airborne, treat the sample with a few drops of Lucite solution, air-dry, and count.

NOTE: Instruction 7 of the procedure is omitted because it applies to internal counters rather than window counters.

5. CALCULATION AND REPORTING

a. Counting error: Determine the counting error, E (in picocuries per sample), at the 95% confidence level from:

$$E = \frac{1.96\ \sigma(R)}{2.22e}$$

where $\sigma(R)$ is calculated from Eq 5 (Section 300F), using $t_1 = t_2$ (in minutes); and e, the counter efficiency, is defined and calculated as in Section 300C. 1f preceding.

b. Alpha activity of water, biologic samples, or silts: Report the alpha activity of water, in pCi/l, by the equation

$$\text{Alpha} = \frac{\text{net cpm} \times 1{,}000}{2.22e\ v}$$

where:

e = calibrated overall counter efficiency (see Section 300C.1f), and v = volume of sample counted, in ml.

The counting error must also be expressed in terms of picocuries per liter by dividing the picocuries per sample by the sample volume in liters. Similarly, calculate and report the alpha activity in picocuries or nanocuries per kilogram of moist biologic material or per kilogram of moist and per kilogram of dry silt.

NOTE: The DEP suggests reporting detection limits when no activity is found. The 4.66 sigma criterion is most common when assigning detection limits.

c. Gross beta activity when alpha activity is insignificant: For samples having an alpha activity less than one-half the beta counting error, calculate and report the gross beta activity and counting error in picocuries or nanocuries per liter of water or fluid, per kilogram of moist (live weight) biologic material, or per kilogram of moist and per kilogram of dry silt, according to a and b above, disregarding the slight amount of alpha activity.

For calculation of the picocuries per liter of beta activity, the value of e in the above equation is determined as described in Section 300C. 1f preceding.

d. Beta activity when alpha activity is significant: In samples containing an alpha activity (in cpm) which exceeds one-half the

beta error in (cpm), deduct the net alpha cpm from the net beta cpm to give the net corrected beta cpm. Proceed as in c above to calculate and report the beta radioactivity in picocuries or nanocuries per liter of water, per kilogram of moist biologic sample, or per kilogram of moist and per kilogram of dry silt. When the count of alpha activity at the beta plateau represents a small fraction of the activity, a rough approximation of the beta counting error consists of the gross beta counting error. Where greater precision is desired -- for example, when the count of alpha activity at the beta plateau is a substantial fraction of the net cpm of gross beta activity -- the beta counting error equals $(E_a^2 + E_b^2)^{1/2}$, where E_a is the alpha counting error and E_b the gross beta counting error.

e. Miscellaneous information to be reported: In reporting radioactivity data, it is important to identify adequately the sample, sampling station, date of collection, volume of sample, type of test, type of activity, type of counting equipment, standard calibration solutions used (particularly when standards other than natural uranium for alpha or cesium 137 for beta were used), time of counting (particularly if short-lived isotopes are involved), weight of sample solids, and kind and amount of radioactivity. So far as possible, the data should be tabulated for ease of interpretation and repetitious items should be incorporated in the table heading or in footnotes. Unless especially inconvenient, quantity units should not change within a given table. For low-level assays, where the counting error represents a significant fraction of the measurement, it should be reported to assist in the interpretation of results.

300 F. Statistics

In practice, all counting instruments have a background counting rate, B, when no sample is present. When a sample is present, the counting rate increases to R_0. The counting rate R due to the sample then is:

$$R = R_0 - B \qquad (4)$$

By propagation-of-error methods, the standard deviation of R can be calculated as follows:

$$\sigma(R) = \left(\frac{R_0}{t_1} + \frac{B}{t_2}\right)^{1/2} \qquad (5)$$

where t_1 and t_2 are the times at which the gross sample and background counting rates were measured, respectively.

PRO-022-25

DETERMINATION OF TOTAL RADIUM IN WATER SAMPLES

1.0 INTRODUCTION

This procedure presents a radiometric method for determining total radium activity (alpha) in water samples. Stable barium carrier is added to the sample and radium is co-precipitated with barium sulfate. The precipitate is collected and mounted on a millipore filter. The precipitate mass is determined by weighing the filter before and after mounting the sample. The filter, mounted in a planchet, is counted on an automatic proportional counter. Results are calculated using an empirical self absorption curve which allows for the change in effective alpha counting efficiency caused by the precipitate mass. The calculation includes a factor to compensate for activity attributed to alpha emitting daughters of Ra-226 which are re-establishing secular equilibrium during the time period between the precipitation and the midcount time.

This procedure is based on Method 900.1 of the Environmental Protection Agency, described in EPA-600/4-80-032, August 1980.

2.0 DETECTION CAPABILITY

Detection capability depends upon sample size, chemical yield, the counting interval, the ingrowth factor for alpha daughters of Ra-226, and the efficiency and background of the counting instrument. The MDL for total radium activity (alpha) is nominally 0.5 picocurie per liter at the 4.66 sigma

Issue and Revision	Pages	Prepared By	Date	Effective Date	Approved By
Draft	4	J. D. Martin	10/17/83	07/01/83	J. D. Mart
Revision	6	H. Jeter HWJ	01/05/84	01/05/84	J. D. Martin

level (0.3 pCi/ℓ at the 2.83 sigma level). The MDL is based on a 50-minute counting time, a chemical yield of 0.90, an ingrowth factor of 1.5, a sample volume of 1ℓ, a detector background of 0.15 cpm and efficiency of 0.16 for precipitate mass of 0.03 gram.

3.0 SAMPLE SELECTION PROCEDURE

(a) Using the Sample Receipt Form with the Teledyne Isotopes sample number, locate the sample (or sample group) in the Sample Receiving Storage Room and transport them to the Alpha-Beta Laboratory.

(b) Begin filling out the Radiochemical Work Sheet, entering the customer name, the sample number, total radium (as the analysis), sample collection date, the sample preparation date and the initials of the analyst.

(c) Make an entry in the Laboratory Data Book showing customer name, sample numbers, sample type, collection dates and desired analysis.

4.0 CHEMICAL SEPARATION PROCEDURES

(a) Write the Teledyne Isotopes sample number on a 2-liter beaker. Shake the sample container and decant into the beaker, filling to the 1 liter mark.

(b) Adjust pH to 3 with HNO_3 as follows: Using a dropping bottle, add conc HNO_3 to the sample while stirring with a clean glass rod. Withdraw the rod periodically and touch to pH paper. Continue until a pH 3 color indication is obtained.

(c) Allow beaker to stand approximately 10 minutes to settle any particulate matter.

(d) Gravity filter the sample through a 18.5 cm diameter fiberglass filter which is folded in quarters and inserted in the mouth of a glass funnel. Receive the filtrate in another 2-liter beaker which is marked with the sample number.

(e) Using a volumetric pipet, add 2.00 ml standardized Ba carrier to the filtered sample (nominally 18 mg Ba/ml). Stir with a glass rod.

(f) Place the filtered sample beaker (now containing Ba carrier) on a hotplate and bring to near boiling.

(g) Using a disposable pipet, add 3 ml K_2SO_4 reagent (nominally 60 mgK_2SO_4/ml) to the sample. Stir with a glass rod. Record the date and time of this addition in the laboratory data book.

(h) Allow the sample beaker to remain on the hotplate another 30 minutes (at a temperature slightly below the boiling point). A fine white $BaSO_4$ precipitate should form and fall to the bottom of the beaker. Remove beaker from the hotplate and allow to cool.

5.0 MOUNTING THE PRECIPITATE

(a) Prepare a new 2-inch stainless steel planchet for each sample by first wiping it clean with a kimwipe. Write customer name, sample number, and analysis (TOT Ra) on a gummed label and stick to the back of the planchet.

(b) Place a 0.45 μm millipore filter in each labeled planchet. Weigh each (including its filter) on an analytical balance and record this tare weight beside the sample number in the Laboratory Data Book.

(c) Set up a vacuum filter (millipore) apparatus for each sample by inserting a fritted glass filter holder in a 1-liter sidearm flask. Taking the samples in numerical order, place the millipore filter on the vacuum apparatus, add the specially designed funnel and fix in place with a clamp.

(d) Vacuum filter the sample into the correspondingly numbered millipore apparatus. Filtration is fastest if the precipitate is allowed to remain at the bottom of the beaker and is filtered last.

(e) In the last phases of filtration, rinse the sample beaker with deionized water from a wash bottle and add this rinse to the funnel. Do not use a methanol rinse.

(f) Disconnect the vacuum apparatus. Remove the filter gently with a spatula and transfer it to its planchet (observing the numerical order of samples).

(g) Place planchets (containing their filters with precipitates) in a fiber tray in a hot air oven (100°C), or under heat lamps, to dry.

(h) Take the tray containing dried samples to the analytical balance. Weigh each planchet and record final weight next to the corresponding tare weight in the Laboratory Data Book.

(i) Subtract the tare weight from the final weight and record this mount weight in Laboratory Data Book and on the Radiochemical Work Sheet. Divide mount weight by the carrier standardization value (written on the Ba carrier flask) to obtain chemical yield. Record yield on the Radiochemical Work Sheet and in Laboratory Data Book.

(j) Complete the entries on the Radiochemical Work Sheet, adding the sample aliquot used and the date and time of K_2SO_4 addition. Submit the Radiochemical Work Sheet and the tray of finished

planchets to the Radiochemistry Counting Room for radioassay.

6.0 SAMPLE COUNTING PROCEDURE

(a) Verify that the sample tray containing a group of sample planchets contains the same sample numbers as the accompanying Radiochemical Work Sheets.

(b) Write counting sequence numbers on the work sheets following the order that the sample numbers appear on the sheet. Begin with the number 1 if starting a new sample counting group; otherwise use the number which follows the last sequence number assigned.

(c) Remove the sample planchets from the tray in sequence number order, verifying in each case that the sample number on the back of the planchet matches the sequence number. Transfer each to a plastic planchet holder and then to the counting cassette in sequence number order.

(d) Write the counting start date and time, and the number of the automatic proportional counter on the first work sheet.

(e) Load the cassette into the counter and set the counting mode for alpha. Set the counting interval for 50 minutes unless a different interval is specified for greater sensitivity.

(f) After all samples in the group have been counted, copy the printed counts and counting interval for each sample onto the Radiochemical Work Sheet in the space provided. Also record the count date and time for each sample (certain automatic proportional counters print the count start time; others do not, requiring a summation of counting intervals from the first sample count).

(g) Unload the sample planchets from the holders and store in the rack for processed alpha and beta samples.

7.0 CALCULATION OF THE SAMPLE ACTIVITY OR OF THE MDL

(a) Sample activity and the 2 sigma counting error are calculated as follows:

7.0 CALCULATION OF THE SAMPLE ACTIVITY OR OF THE MDL

(a) Sample activity and the 2 sigma counting error are calculated as follows:

$$\frac{\text{Net pCi}}{\text{unit volume}} = \underbrace{\frac{\frac{N}{\Delta t} - \beta}{2.22(v)(p)(\varepsilon)}}_{\text{net activity}} \pm \underbrace{\frac{2\sqrt{\frac{\frac{N}{\Delta t} + \beta}{\Delta t}}}{2.22(v)(p)(\varepsilon)}}_{\text{counting error}}$$

where: N = total counts from sample (counts)

Δt = counting time for sample (min)

β = background rate of counter for alpha (cpm)

$2.22 = \frac{\text{dpm}}{\text{pCi}}$

v = volume of sample analyzed

ε = efficiency of the counter for Ra-226 alpha, determined empirically as a function of precipitate mass.

p = Radium-226 alpha ingrowth factor:

$$p = 1 + 3(1-e^{-\lambda t})$$

λ = decay constant of Rn-222, 0.007551 hr^{-1}

t = elapsed time (hrs) from the time of $BaSO_4$ separation to the mid-point of the counting period.

(b) Establishing and reporting activities that are equal to or less than the detection limit:

If the net activity $\left(\frac{\frac{N}{\Delta t} - \beta}{2.22(v)(p)(\varepsilon)}\right)$ is equal to or is less than a designated multiple of the background counting error, the activity is

below the limits of detection and is called "less than" (L.T.) or "minimum detectable level" (MDL).

The L.T. value can be specified by stating only the counting error at a predetermined multiple (σm) of the one sigma statistics. A sigma multiple (σm) of 4.66 is used for calculation of the L.T. values unless the customer requests another value such as 2.83.

$$\text{thus L.T.} = \frac{\sigma m \sqrt{\frac{\beta}{\Delta t}}}{2.22\,(v)(p)(\varepsilon)}$$

TELEDYNE ISOTOPES

DETERMINATION OF RA-226 IN WATER

1.0 INTRODUCTION

The procedure describes the method of determining Ra-226 in water samples by the emanation technique. Radon-222 is equilibrated with the parent radionuclide, Ra-226, and then transferred through a closed system to an evacuated one-liter alpha chamber. The Rn-222 and daughters activities are measured in successive counting periods for an eighteen hour period.

2.0 DETECTION CAPABILITY

The minimum detectable level (MDL) for water samples is nominally 0.1 pCi/ℓ for Ra-226 at the 4.66 sigma confidence level. This figure is based upon a sample volume of 0.5ℓ, a counting time of 1000 minutes, and upon representative values of counting efficiency (for Rn-222 and two alpha emitting daughters) and background of 2.45 and 2.3 cpm, respectively.

3.0 SAMPLE SELECTION PROCEDURE

(a) Using the Sample Receipt Form with the Teledyne Isotopes sample number, locate the sample (or sample group) in the Sample Receiving and Storage Room. Transport the sample(s) to the Gas Analysis Laboratory.

(b) Begin filling out the Calculation Sheet -- Ra-226 Gas Counting form, entering the customer name, the sample number, sample collection date, the sample preparation date and the initials of the analyst.

4.0 SAMPLE PREPARATION PROCEDURES

(a) Transfer 0.5ℓ of water to a labeled emanation flask and close the flask from the atmosphere through the tapered, ground seal. Different volumes of sample may be used in order to

TELEDYNE ISOTOPES

obtain different minimum detection levels and depending on the availability of sample volume. 11/C

(b) Connect flask to helium supply and pass helium for ten minutes through the frited disk. The bubbling from the frit purges radon from the sample.

(c) Close the two stopcocks on the emanation flask.

(d) Set flask aside for two weeks to permit the Rn-222 activity to equilibrate with the Ra-226, if any, in the water.

5.0 DETECTOR LOADING

After two weeks, proceed with following steps.

(a) Attach the flask to an evacuated 1ℓ volume alpha counting chamber through the gas handling system.

(b) Open the stopcock on the flask which will permit Rn-222 (and any residual He) to pass into the 1ℓ counting chamber.

(c) After ten minutes attach the He supply to the other stopcock and open stopcock and flow He through the frit, water sample and into the 1ℓ counting chamber until a pressure of one atmosphere is reached on the vacuum gauge. This step and step (b) transfers Rn-222 from the water sample to the counting chamber.

(d) Close the vacuum valve attached to the 1ℓ counting chamber.

6.0 SAMPLE COUNTING

(a) Turn on high voltage power supply and adjust voltage to predetermined counting voltage.

(b) After two minutes, erase any counts on the scaler and push the start accumulation button. Record the start time. 11/05/86

(c) Record Count at 60 minute intervals until ingrowth of Rn-222 daughters is complete as indicated by a maximum count. If activity is indicated by the count, recount the following day for 60 minutes to verify the presence of Rn-222 by the decay.

7.0 STANDARDS AND CONTROL OF COUNTERS

(a) A Ra-226 standard which is NBS traceable, is counted in the same manner as described above once per month. The efficiency of the combined radon extraction from the sample and the nuclear counting is determined with the standard. Record the results on a chart.

TELEDYNE ISOTOPES

8.0 CALCULATION OF Ra-226 ACTIVITY

The Ra-226 activity is determined from the Rn-222 activity as follows:

$$\frac{\text{Net pCi}}{\text{unit volume}} = \underbrace{\frac{\left(\frac{N}{\Delta t} - \beta\right)e^{\lambda t_2}}{2.22(v)\ (\varepsilon)\ (1-e^{-\lambda t_1})}}_{\text{net activity}} \pm \underbrace{\frac{2\left(\sqrt{\frac{N+\beta}{\Delta t}}\right)e^{\lambda t_2}}{2.22(v)\ (\varepsilon)\ (1-e^{-\lambda t_1})}}_{\text{counting error}}$$

where:

N = total counts from sample (counts)

Δt = counting time for sample (min)

β = background rate of counter (cpm)

$2.22 = \frac{\text{dpm}}{\text{pCi}}$

v = volume of sample analyzed

ε = efficiency of the counter

$(1-e^{-\lambda t_1})$ = determines the "ingrowth" of Rn-222 from Ra-226 during the time lapse of t_1

t_1 = the time lapse of the first helium purge to the second helium purge

λ = the decay constant for Rn-222

$e^{\lambda t_2}$ = the correction for Rn-222 decay from the mid count time to the time it was transferred to the counting chamber

t_2 = the time lapse from transfer to chamber to mid count time

Establishing and reporting activities that are equal to or less than the detection limit:

If the net activity is equal to or is less than a specified multiple of the background counting error, the activity is below the limits of detection and is called "less than" (L.T.) or "minimum detectable level" (MDL).

The L.T. value can be specified by stating only the counting error at a predetermined multiple (σm) of the one sigma statistics. A sigma multiple (σm) of 4.66 is used for calculation of the L.T. values unless the customer requests another value such as 2.83. 10/04

$$\text{thus L.T.} = \frac{\sigma m \sqrt{\frac{\beta}{\Delta t}} \left(e^{\lambda t_2} \right)}{2.22(v)(\epsilon)(1-e^{-\lambda t_1})}$$

IV. INFORMATION AND ANALYSIS OF EFFLUENT QUALITY FOR OTHER POTENTIALLY TOXICS POLLUTANTS

1 Information on Chemical Additives Known or Expected to be Present in the Discharge

(Read instructions carefully and use the tabular format and additional pages, where necessary, to present the required information)

Outfall	Chemical Substance or Compound Trade Names or Specific Ingredients	Manufacturer Name and Address	Average & Maximum Usage Rate lbs/day	Concentration			Lowest Possible Analytical Detection Level (µg/l)	Whole product 96 Hr LC50 (mg/l) and species(1)	Whole product 48 Hr LC50 (mg/l) and species(1)
				In-system	Effluent	Units			
071	Powerline PPL08 *2-propenoic acid polymer with 2-hydroxy-3- (2-propenyloxy) -1-propane sulfonic acid*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	Avg - 500 Max - 2,000	2,000	2,000	µg/L	1,500 µg/L	Fathead Minnow (1960 mg/l)	Daphnia Magna (1767 mg/l)
071	Powerline PPL09 *Hydroxy ethylidene diphosphonic acid (HEDP)*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	Avg - 225 Max - 1,000	1,000	1,000	µg/L	50 µg/L	Rainbow Trout (610 mg/l)	Daphnia Magna (870 mg/l)
071	ClamTrol CT-1 *Alkyl Dimethyl Benzyl Ammonium Chloride (ADBAC) and Dodecyl Guanidine Hydrochloride (DGH)*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	Avg - 770 Max - 10,000 (See Note #1)	15,000	<200	µg/L	200 µg/L	Fathead Minnow (3.7 mg/l)	Daphnia Magna (0.2 mg/l)
071	Betz DT-S *Bentonite Clay Slurry*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	Avg - 800 Max - 12,500	0	10,000	µg/L	--	Fathead Minnow (435 mg/l)	Daphnia Magna (435 mg/l)
071	Betz Copper-Trol Cu-1 *Butylbenzyl triazole*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	(See Note #1)	--	--	--	--	Rainbow Tourt (28.1 mg/l)	Daphnia Magna (112.5 mg/l)
071/072	Slimicide C-68 *2-methyl-4-isothiazolin-3-one and 5-chloro -2-methyl-4-isothiazolin-3-one*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	(See Note #2)	--	--	--	--	Rainbow Trout (8.7 mg/l)	Daphnia Magna (6.6 mg/l)

(1) If LC50 Data for whole product is not available, data for the individual active ingredients may be provided

SECTION C (Continued) NPDES Number PA 0047325

IV. INFORMATION AND ANALYSIS OF EFFLUENT QUALITY FOR OTHER POTENTIALLY TOXICS POLLUTANTS

I Information on Chemical Additives Known or Expected to be Present in the Discharge

(Read instructions carefully and use the tabular format and additional pages, where necessary, to present the required information)

Outfall	Chemical Substance or Compound (Trade Name or Specific Ingredients)	Manufacturer Name and Address	Average & Maximum Usage Rate lbs/day	Concentration			Lowest Possible Analytical Detection Level (µg/l)	Whole product 96 Hr LC50 (mg/l) and species[1]	Whole product 48 Hr LC50 (mg/l) and species[1]
				In-system	Effluent	Units			
071	Powerline 3625 *Alkyl Dimethyl Benzyl Ammonium Chloride (ADBAC)*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	Avg - 400 Max - 5,000	5,000	<50	µg/L	50 µg/L	Fathead Minnow (0.73 mg/l)	Daphnia Magna (0.04 mg/l)
071	NUSYN-Noxfish *Rotenone*	Roussel Bio Corp. 170 Beaver Brook Road Lincoln Park, NJ 07035	See Note #3	–	–	–	–	–	–
071	Sonar SRP Pellets or Sonar 5P Liquid *1-methyl-3-phenyl-5-(3-(trifouromethyl) phenyl)-4(1H)-pyridinone*	SePRO 11550 N. Meridian Carmel, IN 46032	See Note #3	–	–	–	–	–	–
071/171	Powerline PPL-04 *Methylbenzyl Triazole*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	See Note #4	10,000	10,000	µg/L	<200 µg/L	Bluegill Sunfish (109.3 mg/l)	Daphnia Magna (311.2 mg/l)
171	Cobratec TT-50-S *Methylbenzyl Triazole*	PMC Specialties Group501 Murray RoadCincinnati OH 45217	See Note #4	10,000	10,000	µg/L	<200 µg/L	Rainbow Trout (23.7 mg/l)	–
071/079	*Sodium Hypochlorite* (Betz C-70)	Various	–	500	500	µg/L	50 µg/L	Rainbow Trout (1.9 mg/l)	Daphnia Magna (1.6 mg/l)
071	Slimicide C-94 *Sodium Bromide*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	See Note #5	–	–	µg/L	–	Rainbow Trout (0.23 mg/l)	Daphnia Magna (0.71 mg/l)
072	Powerline 3200 *Sodium Molybdate, Sodium Nitrite, methyl benzotriazole*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	See Note #5	–	–	–	–	Bluegill Sunfish (3255 mg/l)	Daphnia Magna (5997 mg/l)

(1) If LC50 Data for whole product is not available, data for the individual active ingredients may be provided

IV. INFORMATION AND ANALYSIS OF EFFLUENT QUALITY FOR OTHER POTENTIALLY TOXICS POLLUTANTS

1 Information on Chemical Additives Known or Expected to be Present in the Discharge

(Read instructions carefully and use the tubular format and additional pages, where necessary, to present the required information)

Outfall	Chemical Substance or Compound Trade Names or Specific Ingredients	Manufacturer Name and Address	Average & Maximum Usage Rate lbs/day	Concentration			Lowest Possible Analytical Detection Level (µg/l)	Whole product 96 Hr LC50 (mg/l) and species(1)	Whole product 48 Hr LC50 (mg/l) and species(1)
				In-system	Effluent	Units			
072	Powerline PPL10 *Sodium Nitrite and Borate*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	See Note #6	–	–	–	–	Not Available	Not Available
071	Betz 860 *Proprietary Descaling Agent*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	See Note #6	–	–	–	–	Fathead Minnow (1500 mg/l)	Daphnia Magna (1000 mg/l)
071/079	Powerline 3680 *Ammonium Bisulfite*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	See Note #6	–	–	–	–	Fathead Minnow (250 mg/l)	Daphnia Magna (250 mg/l)
071	BioTrol 88P *Bromochloro dimethyl Hydantoin (BCDMH)*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	See Note #6	–	–	–	–	Not Available	Not Available
071	HEPCO 4E-50 *Sodium Poly methacrylate*	Hennigan Engineering Company 86 Finnell Drive Weymouth MA 02188	See Note #7	–	–	–	–	–	–
071	Powerline 3450 *Copolymer of 2-propenoic acid and 1,2.-propanediolmono-2-propenoate*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	See Note #6	7,000	7,000	µg/L	7,000	Fathead Minnow (19062 mg/l)	Daphnia Magna (3558 mg/l)
071/072	Prefilm 108L *Polyoxyethylene nonylphenyl ether phosphate*	Betz Laboratories 4636 Somerton Road Trevose, PA 19053	See Note #6	–	–	–	–	–	Daphnia Magna (500 mg/l)

(1) If LC50 Data for whole product is not available, data for the individual active ingredients may be provided

SECTION C (continued) NPDES Number PA 0047325

IV. INFORMATION AND ANALYSIS OF EFFLUENT QUALITY FOR OTHER POTENTIALLY TOXICS POLLUTANTS

I Information on Chemical Additives Known or Expected to be Present in the Discharge

(Read instructions carefully and use the tabular format and additional pages, where necessary, to present the required information)

Outfall	Chemical Substance or Compound (Trade Name or Specific Ingredients)	Manufacturer Name and Address	Average & Maximum Usage Rate lbs/day	Concentration			Lowest Possible Analytical Detection Level (µg/l)	Whole product 96 Hr LC50 (mg/l) and species[1]	Whole product 48 Hr LC50 (mg/l) and species[1]
				In-system	Effluent	Units			
071	J-Poly 101C	Johnston Polymer Company, Inc. PO Box 86 Manuel TX 77578	Avg - 3.5 Max - 7.0	6,000	600	µg/L	500	Sunfish (>1,000 mg/l) Trout (>1,000 mg/l)	Daphnia (>1,000 mg/l)
071/072/079	Miscellaneous	See Note #8							
--	Other Waste Treatment Chemicals	See Note #9							

jsf/tbe3620c(26)

(1) If LC50 Data for whole product is not available, data for the individual active ingredients may be provided

SECTION C-IV NOTES

NOTE #1 Betz Copper-trol CU-1 is not currently being used. It is included in the permit as an alternate copper/copper alloy corrosion inhibitor to the currently used inhibitor, methyl benzotriazole (TTA). If used, this product would be applied on an intermittent basis (once every two to four weeks) for a relatively short duration (15 to 30 minutes). Maximum concentration of the product during these applications would be near or below detection limit levels using a field test procedure.

NOTE #2 Betz Slimicide C-68 is injected into closed system cooling water to a recommended average effluent concentration of 50 mg/l of product or 0.75 mg/l as active isothiazolin. No fields test exists for this product; however, if used this product would not be expected to be detected in Outfall 071. See Additional Information for Section C-I Outfall 072 for a discussion of product use.

NOTE #3 NUSYN - Noxfish and Sonar/Sonar 5P are products used in the Spray Pond that have been permitted for use by the Pa Fish and Boat Commission and the Pa DER. Neither product is routinely monitored in Outfall 071. See attached permit.

The Emergency Spray Pond is treated with NUSYN - Noxfish to a level of 5 mg/l; however, it is detoxified with potassium permanganate at a rate equal to this concentration prior to discharge and, therefore, is not expected to be present in Outfall 071.

NOTE #4 Copper corrosion inhibitors used in closed cooling systems at the station are not usually discharged to Outfall 071. During maintenance activities water may be collected and taken to the Cooling Tower Basin or Sewage Treatment Plant for discharge to the river.

NOTE #5 Possible substitute for chlorine as biocide.

NOTE #6 Chemicals not previously used at the Susquehanna Steam Electric Station.

NOTE #7 Based on past usage of Hennigan's HEPCO Formula 4E-50, the maximum concentration of solution entering the Susquehanna River, assuming no dilution from either the Cooling Tower Basin or blowdown line, would be approximately 1.45 mg/l. Although this product is not analyzed routinely, it is not expected to be present in the discharge.

NOTE #8 Miscellaneous - There are several chemicals used in very small quantities for cleaning surfaces, cooling coils, decontamination of floors, walls, and equipment, cleaning agents and liquid dye for flow tests. Some of these chemicals are:

Chemical	Est. gal/yr
• Geo-Guard 4813	*
• Coil Rite	*
• By•Pas	220
• Organic Orange	110
• MSA/Cleaner/Sanitizer II	288**
• Rhodamine WT	***
• Liquid Bleach	12
• Spartan SD-20	*
• Touch It Up	*

*Not available
**Ounces
***Only if needed

Some of these chemicals may be disposed of in Cooling Tower Basin or Sewage Treatment Plant in accordance with Material Safety Data Sheets. Sheets are attached.

Note #9 At present bids are being reviewed to update water treatment program at the Susquehanna SES. An updated form C-IV will be provided to the PaDER in November 1994. A request for proposal for a water treatment program is usually conducted every four years or as needed.

jsf/msf3663c(26)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES

667 North River Street
Plains, PA 18705-1099
May 25, 1994

(717) 826-2575

Northeast Regional Office

Pennsylvania Power & Light Co.
Susquehanna Steam Electric Station
P.O. Box 467
Berwick, PA 18603

RE: Herbicide
Emergency Service Water Spray Pond for the
Susquehanna Steam Electric Station
Salem Township,
Luzerne County

Dear Sirs:

Enclosed is your permit for application of aquatic control chemicals. You should use extreme caution and follow the directions on the manufacturer's label when using these chemicals. It is your responsibility to conduct treatment operations in an environmentally safe manner.

Water treated with these chemicals should not be used for human consumption, irrigation, or livestock watering for a period of time as specified on the manufacturer's label. This time period will vary with the chemical used.

Some chemicals also require restricted recreational uses (i.e. swimming and fishing) for time periods as designated on the label. When these chemicals are used in areas open to the public, you are responsible to assure that proper controls are implemented in the treated areas.

You are responsible for any damages incurred by the chemicals used.

If you have any questions, please feel free to contact me.

Sincerely,

Lawrence A. Pawlush

Lawrence A. Pawlush
Program Manager
Water Supply and Community Health Program

Enclosure

ER-BCEC-14-3487

NE-40-10-94

COMMONWEALTH OF PENNSYLVANIA
FISH COMMISSION — DEPARTMENT OF ENVIRONMENTAL RESOURCES
ENVIRONMENTAL QUALITY BOARD

RECEIVED
APR 21 1994
PA Fish & Boat Comm.
Division of Environmental Svc.

MAY 19 1994 C.E.C.

APPLICATION AND PERMIT FOR USE OF AN ALGICIDE, HERBICIDE OR FISH CONTROL CHEMICAL IN WATERS OF THE COMMONWEALTH

Submit one copy of the completed application to the Pennsylvania Fish Commisison, 450 Robinson Lane, Bellefonte, PA 16823. Telephone (814) 359-5100.

1. Name of applicant (owner) Pennsylvania Power & Light Co. Susquehanna Steam Electric Station Telephone No. 717-542-3300

   Address of applicant PO Box 467, Berwick, PA 18603

2. Person or organization conducting treatment (if other than applicant) Theodore V. Jacobsen

   Ecology III, Inc., RR 1, Box 1795, Berwick, PA 18603 (717) 542-2191

3. Name of water body to be treated Emergency Service Water Spray Pond for the Susquehanna Steam Electric Station

4. Location of water body: County Luzerne Township or other municipa

   Salem Nearest built-up area Beach Haven

5. Type of water body: Pond _____ Lake _____ Impoundment X Canal _____

6. Uses of water body to be treated:

   Water Supply: Municipal _____ Industrial X Livestock _____ Irrigation _____

   Fire Protection _____ Other _____

   Water Contact Sports: Swimming _____ Skiing _____

7. Does water contain fish? Yes X No _____ Warmwater species X Coldwater species (trout) _____

8. Is water body open for public fishing? Yes _____ No X

9. Has water body ever been stocked with fish by a State Agency? No Federal Agency? No

10. Does water body have a discharge or overflow of water? Yes X No _____

    If YES, indicate time of year discharge or overflow will occur Intermittently throughout the year

11. Name of receiving stream Susquehanna River

12. Total area of water body: Number of surface acres eight (8)

    Treatment area: Number of surface acres 8 Average depth 10.5 feet

13. Indicate species of algae, plant(s) or fish to be controlled leafy pondweed, planktonic & periphytic algae, and various species of fishes native to the Susquehanna River which are inadvertently introduced as larvae in make-up river water.

14. Commercial name(s) of chemical(s) Sonar SRP - weeds, Powerline 3625 - algae, Nusyn-Noxfish (2.5% Rotenone) - fish

15. Manufacturer's name(s) Sonar - Elanco Products Co., Indianapolis, IN
    Powerline 3625 - Betz Laboratories, Inc., Trevose, PA
    Nusyn-Noxfish - Roussel Bio Corporation, Englewood Cliff, NJ

Dosage of each chemical per treatment (specify in either pounds or gallons) (see attached sheet for *)

Sonar SRP (0.8 a) * Powerline 3625 (0.2 a)** Nusyn-Noxfish (8 a)

(a) 40 pounds per surface acre 12.5 gallons per surface acre 16.0 gal

Avg. shoreline depth = 5' Avg shoreline depth = 5' Entire pond = 10.5'

(b) 8 pounds per acre foot 2.5 gallons per acre foot 1.5 gal

c) Amount of each chemical to be applied in each treatment (pounds or gallons)

Sonar = 32 lbs, Powerline 3625 = 2½ gal, Nusyn-Noxfish = 128 gal

(d) Number of treatments to be made this year Sonar = 1, Powerline 3625 = 32, Nusyn-Noxfish = 1

(e) Total amount of each chemical to be applied in all treatments (pounds or gallons)

Sonar = 32 lbs, Powerline 3625 = 80 gal, NUsyn-Noxfish = 128 gal

Proposed date or dates of treatment Sonar = 15 Jun 1994, Nusyn Noxfish = 3 Aug 1994, Powerline 3625 = Apr-Nov 1994 (twice/week)**

(Fish Commission Waterways Conservation Officer *MUST* be contacted prior to treatment.)

Additional information see attached sheet

Have all other potential users of the treated water been notified of the treatment?

Yes _____ No X (This notice is required.)

(a) If so, has each of the other users approved your plans for treatment? Yes _____ No X.

(b) Has each potential user agreed to restrictions on his/her usage if such restrictions are necessary? Yes _____ No X.

(c) If your answer to (a) or (b) is no, please explain: The subject water is in an industrial basin. There are no offsite users of this basin.

d) List other potential users and their uses: _____

. APPLICANT CERTIFICATION

e applicant: (a) has notified all other potential users of the treated water as described in Number 19; (b) agrees to employ e listed chemicals in conformance with the manufacturer's specifications and with all the conditions of the permit; (c) responsible for all damages incurred by the chemicals used; (d) certifies the truth of the above statements.

plicant's Signature X C D Markley Date 4/18/94

R REVIEWER'S USE ONLY APPLICATION AND PERMIT NO. NE-40-10-94

Agency	Reviewer	Title	Date	Approve	Disapprove
sh mmission	Mark A. Hartle	Fisheries Biologist	5/12/94	X	

marks Approval is specific to Sonar SRP and Nusyn-Noxfish for this permit. ince Powerline 3625 will treat algae in cooling water, and Powerline is not abe for general aquatic use, approval for this product must be through NPDES permit.

n	Lawrence A. Dawlush	Program Manager	5/26/94	✓	

emarks This application is approved pursuant to Section 101.5 of the Department's Rules and Regulations. All treatments made must be in strict accordance with manufacturer's recommendations. Will not affect public water supplies.

APPLICATION AND PERMIT FOR USE OF AN ALGICIDE, HERBICIDE OR FISH CONTROL CHEMICAL IN WATERS OF THE COMMONWEALTH

APPLICANT: PP&L - Susquehanna Steam Electric Station

(additional information)

---

16. * perimeter treatment (circumference) is 3,350 ft x 10 ft out from shoreline = 0.8 a

** ¼ perimeter treatment (840 ft x 10 ft = 0.2 a, twice/week for a 2-week period in each month, Apr-Nov 1994)

18. Powerline 3625 will not have to be detoxified at the proposed rate of application.

Nusyn-Noxfish will be detoxified at the Spray Pond outlet by "drip feeding" potassium permanganate at a rate equal to the concentration of Nusyn-Noxfish in the overflow water.

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

RODUCT : POWERLINE PPL08

EFFECTIVE DATE:04-30-93
PRINTED: 04-30-93

RODUCT APPLICATION:WATER-BASED CORROSION INHIBITOR/DEPOSIT CONTROL AGENT.

----SECTION 1----------HAZARDOUS INGREDIENTS----------

NFORMATION ON PHYSICAL HAZARDS,HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC RODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS ISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE ND CHRONIC HAZARDS OF THIS FORMULATION.THIS PRODUCT IS SUBJECT TO THE ENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

HIS PRODUCT IS NOT HAZARDOUS AS DEFINED BY OSHA, PENNSYLVANIA, OR EW JERSEY RIGHT TO KNOW REGULATIONS

ONHAZARD INGREDIENTS: WATER(CAS# 7732-18-5);2-PROPENOIC ACID POLYMER WITH 2-HYDROXY-3- (2-PROPENYLOXY)-1-PROPANE SULFONIC ACID,SODIUM SALT(CAS# 78266-09-8)

----SECTION 2----------TYPICAL PHYSICAL DATA----------

H: AS IS(APPROX.) 5.2	ODOR: SLIGHT
L.PT.(DEG.F):> 200 P-M(CC)	SP.GR.(70F): 1.169
APOR PRESSURE(mmHG): ~ 18.0	VAPOR DENSITY(AIR=1): < 1.00
ISC cps70F: 42	%SOLUBILITY(WATER): 100.0
VAP RATE: < 1.00(ETHER=1)	APPEARANCE: YELLOW
HYSICAL STATE:LIQUID	FREEZE POINT(DEG.F): 25.00

----SECTION 3----------REACTIVITY DATA----------

TABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK LEAN-OUT CATEGORY 'B'

HERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

PRODUCT : POWERLINE PPL08

------SECTION 4---------HEALTH HAZARD EFFECTS----------

ACUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
MAY CAUSE SLIGHT IRRITATION TO THE SKIN

ACUTE EYE EFFECTS ***
SLIGHTLY IRRITATING TO THE EYES

ACUTE RESPIRATORY EFFECTS ***
MISTS/AEROSOLS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

CHRONIC EFFECTS OF OVEREXPOSURE***
NO EVIDENCE OF POTENTIAL CHRONIC EFFECTS.

MEDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

SYMPTOMS OF EXPOSURE ***
MAY CAUSE REDNESS OR ITCHING OF SKIN.

-----SECTION 5----------FIRST AID INSTRUCTIONS----------

SKIN CONTACT ***
REMOVE CONTAMINATED CLOTHING.WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR.APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY

INGESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DILUTE CONTENTS OF STOMACH.INDUCE VOMITING BY ONE OF THE STANDARD METHODS.IMMEDIATELY CONTACT A PHYSICIAN

----SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS----------

SPILL INSTRUCTIONS***
VENTILATE,AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER.THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS****
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

PRODUCT : POWERLINE PPL08
----SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------
3[redacted]ROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134.USE
.ESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
VENTILATION PROTECTION***
ADEQUATE VENTILATION
RECOMMENDED RESPIRATORY PROTECTION***
IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH DUST/MIST FILTERS..
RECOMMENDED SKIN PROTECTION***
RUBBER GLOVES
WASH OFF AFTER EACH USE REPLACE AS NECESSARY.
RECOMMENDED EYE PROTECTION***
SPLASH PROOF CHEMICAL GOGGLES

-----SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------
STORAGE INSTRUCTIONS***
KEEP CONTAINERS CLOSED WHEN NOT IN USE.
STORE IN COOL VENTILATED LOCATION.STORE AWAY FROM OXIDIZERS
HANDLING INSTRUCTIONS***
NORMAL CHEMICAL HANDLING
****
THIS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD
****

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

[redacted]CA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY
...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
NOT APPLICABLE
...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE
IDENTIFICATION NUMBER IS:NOT APPLICABLE
...DOT HAZARD/UN#/ER GUIDE# IS : NOT APPLICABLE
...CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS:NONE
...SARA SECTION 302 CHEMICALS:NONE
...SARA SECTION 313 CHEMICALS:NONE
...SARA SECTION 312 HAZARD CLASS:PRODUCT IS NON-HAZARDOUS UNDER SECTION
311/312
...MICHIGAN CRITICAL MATERIALS: NONE
NFPA/HMIS : HEALTH - 1; FIRE - 1; REACTIVITY - 0; SPECIAL - NONE; PE - B

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: POWERLINE PPL08 May 17, 1994

AQUATIC TOXICOLOGY

Fathead Minnow 96 Hour Static Renewal Bioassay
pH of test solutions were adjusted to a level of 6-9.

LC50: 1960 mg/L
No Effect Level: 313

Daphnia magna 48 Hour Static Renewal Bioassay
pH of test solutions were adjusted to a level of 6-9.

LC50: 1767 mg/L
No Effect Level: 1250

BIODEGRADATION

COD (mg/gm): 368 Calculated
TOC (mg/gm): 144 Calculated

BOD-5 (mg/gm): 10 Calculated
BOD-28 (mg/gm): 32 Calculated

Closed Bottle Test
% Degradation in 28 days: 0 Calculated

Zahn-Wellens Test
% Degradation in 28 days: 8 Calculated

MAMMALIAN TOXICOLOGY

Oral LD50 RAT: >2,000 MG/KG
Note - ESTIMATED VALUE

Dermal LD50 RABBIT: >2,000 MG/KG
Note - ESTIMATED VALUE

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

RODUCT : POWERLINE PPL09

EFFECTIVE DATE:05-04-93
PRINTED: 05-04-93

RODUCT APPLICATION:WATER-BASED DEPOSIT CONTROL AGENT.

----SECTION 1----------HAZARDOUS INGREDIENTS----------

NFORMATION ON PHYSICAL HAZARDS,HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC RODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS ISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE ND CHRONIC HAZARDS OF THIS FORMULATION.THIS PRODUCT IS SUBJECT TO THE ENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

PHOSPHONIC ACID,(1-HYDROXYETHYLIDINE)BIS-(HEDP)***CAS# 2809-21-4; EYE IRRITANT; PEL:NOT DETERMINED;TLV:NOT DETERMINED

ONHAZARD INGREDIENTS: WATER(CAS# 7732-18-5)

----SECTION 2----------TYPICAL PHYSICAL DATA----------

H: AS IS(APPROX.) 2.1	ODOR: SLIGHT
L.PT.(DEG.F):> 200 P-M(CC)	SP.GR.(70F): 1.219
APOR PRESSURE(mmHG): ~ 18.0	VAPOR DENSITY(AIR=1): < 1.00
ISC cps70F: 19	%SOLUBILITY(WATER): 100.0
VAP RATE: < 1.00(ETHER=1)	APPEARANCE: COLORLESS
HYSICAL STATE:LIQUID	FREEZE POINT(DEG.F): 20.00

----SECTION 3----------REACTIVITY DATA----------

TABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK LEAN-OUT CATEGORY 'B'

HERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

PRODUCT : POWERLINE PPL09

------SECTION 4---------HEALTH HAZARD EFFECTS----------

'UTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
MAY CAUSE MODERATE IRRITATION TO THE SKIN

ACUTE EYE EFFECTS ***
SEVERE IRRITANT TO THE EYES

ACUTE RESPIRATORY EFFECTS ***
MISTS/AEROSOLS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

CHRONIC EFFECTS OF OVEREXPOSURE***
NO EVIDENCE OF POTENTIAL CHRONIC EFFECTS.

MEDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

SYMPTOMS OF EXPOSURE ***
MAY CAUSE REDNESS OR ITCHING OF SKIN,IRRITATION AND/OR TEARING OF EYES(DIRECT CONTACT).

-----SECTION 5----------FIRST AID INSTRUCTIONS----------

SKIN CONTACT ***
REMOVE CONTAMINATED CLOTHING.WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR.APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY

INGESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DILUTE CONTENTS OF STOMACH.INDUCE VOMITING BY ONE OF THE STANDARD METHODS.IMMEDIATELY CONTACT A PHYSICIAN

----SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS----------

SPILL INSTRUCTIONS***
VENTILATE,AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER.THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS****
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA: FOAM OR WATER CREATE A SLIPPERY CONDITION SPREAD SAND OR GRIT.

PRODUCT : POWERLINE PPL09
----SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------
PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134.USE
RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
VENTILATION PROTECTION***
ADEQUATE VENTILATION
RECOMMENDED RESPIRATORY PROTECTION***
IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH DUST/MIST FILTERS..
RECOMMENDED SKIN PROTECTION***
RUBBER GLOVES
WASH OFF AFTER EACH USE REPLACE AS NECESSARY.
RECOMMENDED EYE PROTECTION***
SPLASH PROOF CHEMICAL GOGGLES

----SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------
STORAGE INSTRUCTIONS***
KEEP CONTAINERS CLOSED WHEN NOT IN USE.
REASONABLE AND SAFE CHEMICAL STORAGE
HANDLING INSTRUCTIONS***
ACIDIC.DO NOT MIX WITH ALKALINE MATERIAL.
****
THIS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD
****

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

..TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY
..REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
NOT APPLICABLE
..RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE
IDENTIFICATION NUMBER IS:NOT APPLICABLE
..DOT HAZARD/UN#/ER GUIDE# IS : NOT APPLICABLE
..CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS:NONE
..SARA SECTION 302 CHEMICALS:NONE
..SARA SECTION 313 CHEMICALS:NONE
..SARA SECTION 312 HAZARD CLASS:IMMEDIATE(ACUTE)
..MICHIGAN CRITICAL MATERIALS: NONE
NFPA/HMIS : HEALTH - 2; FIRE - 1; REACTIVITY - 0; SPECIAL - NONE; PE - B

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: POWERLINE PPL09 May 18, 1994

AQUATIC TOXICOLOGY

Rainbow trout 96 Hour Static Acute Bioassay

LC50: 610 MG/L
NOEL: 250 MG/L

Daphnia magna 48 Hour Static Acute Bioassay

EC50: 870 MG/L
NOEL: 660 MG/L

Bluegill sunfish 96 Hour Static Acut Bioassay

LC50: 1440 MG/L
NOEL: 880 MG/L

Note: This product has not been tested for aquatic toxicity. The data above was generated on tests conducted on the raw materials.

BIODEGRADATION

COD (mg/gm): 217 Calculated
TOC (mg/gm): 52 Calculated

BOD-5 (mg/gm): 1 Calculated
BOD-28 (mg/gm): 1 Calculated

Closed Bottle Test
% Degradation in 28 days: 0 Calculated

Zahn-Wellens Test
% Degradation in 28 days: 2 Calculated

MAMMALIAN TOXICOLOGY

Oral LD50 RAT: >2,000 MG/KG
Note - ESTIMATED VALUE

Dermal LD50 RABBIT: >2,000 MG/KG
Note - ESTIMATED VALUE

BETZ Industrial

product facts

BETZ CLAM-TROL® CT-1
MOLLUSCICIDE

- Exterminates all life stages of common fouling mollusks with short, 6–24 hr applications
- Effective on Asiatic clams, Zebra mussels, ribbed mussels, blue mussels and most other fresh water and salt water mollusks
- Developed for use in a wide range of applications for cooling and service water systems
- Biodegradable — low environmental impact, no heavy metals or EPA priority pollutants
- Photometric test method available for determining product concentration
- Can be detoxified
- A safe, more effective alternative to current treatment methods

DESCRIPTION AND USE

Clam-Trol CT-1 is a unique blend of active ingredients that control mollusk infestation in water systems. Uncontrolled growth of clams and mussels within industrial water systems blocks water lines, restricts flow and heat transfer, damages equipment, and threatens the availability of fire protection systems and safety-related cooling systems. The consequences are reduced plant safety, threatened water supplies, higher maintenance and production costs, and even plant outages.

Low levels of Clam-Trol CT-1, metered to a system for short 6–24 hr application periods, controls all life stages of fresh water and salt water mollusks. After the initial application, the process must be repeated two to six times per year to inhibit recolonization of the system by larvae and juvenile clams and mussels.

Clam-Trol CT-1 is registered with the U.S. Environmental Protection Agency for state-of-the-art control of mollusks as well as bacterial, fungal and algae slimes in:

- recirculating and once-through cooling systems
- influent cooling systems
- auxiliary water and wastewater systems
- fire protection systems
- intake pump bays and intake screen areas
- storage tanks and associated piping
- settling ponds or lagoons
- transport spillways or canals

Clam-Trol CT-1 is a blend of cationic surfactants — *N*-alkyldimethylbenzylammonium chloride (Quat) and dodecylguanidine hydrochloride (DGH). Both are short-lived in plant systems and the environment because of their rapid absorption rate onto naturally occurring anionically charged substrates and sediments. Quat and DGH are readily neutralized by a number of materials, including clays, silts, humic acids, suspended solids and cooling system surfaces.

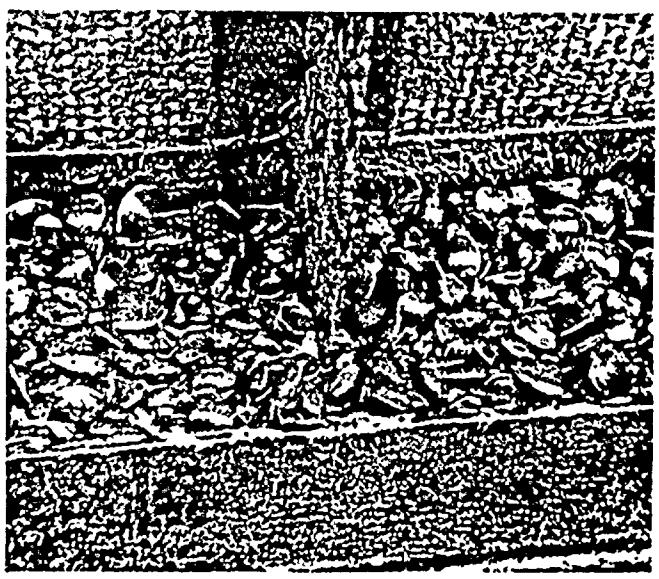


Figure 1. **Asiatic clams growing on the plant side of influent screens. Clam-trol CT-1, unlike halogen or screening methods, controls both larval and adult clams.**

Clam-Trol CT-1 can be actively detoxified by a highly adsorbent, anionically charged material, such as Betz DT-1.

Clam-Trol CT-1 is rapidly biodegradable and contains no heavy metals or EPA priority pollutants.

TREATMENT AND FEEDING REQUIREMENTS

Heavy infestations of mollusks should be physically removed by vacuuming, dredging, or scraping prior to Clam-Trol CT-1 treatment. Removal of the bulk of the shells will help ensure that shells from the dead mollusks are not carried further into the system.

Your Betz Industrial representative will design a program for your system that controls the infestation problem while minimizing both the cost of the treatment and environmental concerns.

Warmer water temperatures and longer contact times reduce the concentration of Clam-Trol CT-1 needed for effective kills. Normally, recirculating or closed systems should be laid up for 12–24 hr after the system is charged with an effective amount of product. Typical charge concentrations are 25–50 ppm.

Once-through systems can be effectively treated by 10–25 ppm of product applied continuously over 6–24 hr and repeated two to six times a year.

Segmenting plant-wide applications of Clam-Trol CT-1 reduces the amount of product that appears in plant effluent. Clam-Trol CT-1 undergoes neutralization and detoxification by natural routes. But your Betz Industrial representative can provide products that accelerate this process. An analytical test procedure is available from Betz that monitors product use and plant outfall levels.

Clam-Trol CT-1 is compatible with stainless steel, copper alloys, and most common plastics and rubbers. Avoid the use of mild steel, low-density polyethylene, nitrile (Buna N), polyurethane, or Viton in handling the concentrated product. A complete listing of compatible feed equipment is available from Betz.

GENERAL PROPERTIES

Appearance	colorless liquid
Density at 70 °F (21 °C)	8.5 lb/gal (1.02 kg/L)
Flash Point (closed cup)	≥ 116 °F (47 °C)
Freeze Point	< -30 °F (-34 °C)
Initial Crystallization Point	< 0 °F (-18 °C)
pH (undiluted)	5.3
(5% solution)	4.9
Brookfield Viscosity at 70 °F (21 °C)	23 cP
EPA Registration No.	3876-145

SAFETY PRECAUTIONS

A Material Safety Data Sheet containing detailed information relative to this product is available upon request.

PACKAGING INFORMATION

Clam-Trol CT-1 is blended as a liquid and is supplied in 55-gal (208-L), bung-type, nonreturnable lined steel drums. Approximate net weight is 460 lb (208 kg) per drum. In addition, Clam-Trol CT-1 is available under BETZ Point Of Feed® and BETZ Semi-Bulk Control™ programs for contracted quantities in certain geographic areas.

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

RODUCT : CLAM-TROL CT-1

EFFECTIVE DATE:05-14-93
PRINTED: 05-14-93

REVISIONS TO SECTIONS: 1

RODUCT APPLICATION:WATER-BASED MICROBIAL CONTROL AGENT.

----SECTION 1----------HAZARDOUS INGREDIENTS----------

NFORMATION ON PHYSICAL HAZARDS,HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC RODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS ISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE ND CHRONIC HAZARDS OF THIS FORMULATION.THIS PRODUCT IS SUBJECT TO THE ENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

ETHYLENE GLYCOL***CAS# 107-21-1; LIVER, KIDNEY AND BLOOD TOXIN;CNS DEPRESSANT;ANIMAL TERATOGEN(HIGH ORAL DOSES);PEL:50PPM-C;TLV:50PPM-C

(C12-16)ALKYL DIMETHYL BENZYL AMMONIUM CHLORIDE***CAS# 68424-85-1; CORROSIVE(SKIN AND EYES); PEL:NOT DETERMINED;TLV:NOT DETERMINED

ISOPROPYL ALCOHOL(IPA)***CAS# 67-63-0;FLAMMABLE LIQUID; CHRONIC OVEREXPOSURE MAY CAUSE LIVER AND KIDNEY TOXICITY;PEL:400PPM (500PPM-STEL); TLV:400PPM (500PPM-STEL)

DODECYLGUANIDINE HYDROCHLORIDE(DGH)***CAS# 13590-97-1; CORROSIVE; PEL:NOT DETERMINED;TLV:NOT DETERMINED

ETHYL ALCOHOL(ETHANOL)***CAS# 64-17-5;FLAMMABLE;EYE IRRITANT;MAY CAUSE DEFATTING DERMATITIS,DIZZINESS AND HEADACHE;PEL:1000PPM;TLV:1000PPM

ONHAZARD INGREDIENTS: WATER(CAS# 7732-18-5)

----SECTION 2----------TYPICAL PHYSICAL DATA----------

H: AS IS(APPROX.) 3.6	ODOR: MILD
L.PT.(DEG.F): 116 SETA(CC)	SP.GR.(70F): 1.022
APOR PRESSURE(mmHG): 23.0	VAPOR DENSITY(AIR=1): > 1.00
ISC cps70F: 23	%SOLUBILITY(WATER): 100.0
VAP RATE: < 1.00(ETHER=1)	APPEARANCE: COLORLESS
HYSICAL STATE:LIQUID	FREEZE POINT(DEG.F): < -30.00

----SECTION 3----------REACTIVITY DATA----------

TABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK LEAN-OUT CATEGORY 'B'

HERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

PRODUCT : CLAM-TROL CT-1

------SECTION 4---------HEALTH HAZARD EFFECTS----------

TE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
CORROSIVE TO SKIN

ACUTE EYE EFFECTS ***
CORROSIVE TO THE EYES

ACUTE RESPIRATORY EFFECTS *** PRIMARY ROUTE OF EXPOSURE
VAPORS,GASES,MISTS AND/OR AEROSOLS CAUSE IRRITATION TO UPPER RESPIRATORY TRACT.

CHRONIC EFFECTS OF OVEREXPOSURE***
PROLONGED OR REPEATED OVEREXPOSURES MAY CAUSE LIVER AND KIDNEY TOXICITY,MAY CAUSE REPRODUCTIVE SYSTEM TOXICITY,MAY CAUSE CNS DEPRESSION,AND/OR MAY CAUSE TISSUE NECROSIS.

MEDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

SYMPTOMS OF EXPOSURE ***
INHALATION OF VAPORS/MISTS/AEROSOLS MAY CAUSE EYE,NOSE,THROAT AND LUNG IRRITATION;SKIN CONTACT MAY CAUSE SEVERE IRRITATION OR BURNS.

PRECAUTIONARY STATEMENT BASED ON TESTING RESULTS ***
MAY BE TOXIC IF ORALLY INGESTED.

-----SECTION 5----------FIRST AID INSTRUCTIONS----------

SKIN CONTACT ***
REMOVE CLOTHING.WASH AREA WITH LARGE AMOUNTS OF SOAP SOLUTION OR WATER FOR 15 MIN.IMMEDIATELY CONTACT PHYSICIAN

EYE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA.APPLY NECESSARY FIRST AID TREATMENT.IMMEDIATELY CONTACT A PHYSICIAN.

I ESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DO NOT INDUCE VOMITING.IMMEDIATELY CONTACT PHYSICIAN. DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER

----SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS----------

SPILL INSTRUCTIONS***
VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBANT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER.THE CONTAMINATED ABSORBANT SHOULD BE CONSIDERED A PESTICIDE AND DISPOSED OF IN AN APPROVED PESTICIDE LANDFILL.SEE PRODUCT LABEL STORAGE AND DISPOSAL INSTRUCTIONS.
REMOVE IGNITION SOURCES.FLUSH AREA WITH WATER.SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS****
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
DISPOSE OF IN APPROVED PESTICIDE FACILITY OR ACCORDING TO LABEL INSTRUCTIONS

FIRE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

RODUCT : CLAM-TROL CT-1

----SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------

ROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134.USE
ESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
ENTILATION PROTECTION***
ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS
ECOMMENDED RESPIRATORY PROTECTION***
IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE & DUST/MIST PREFILTER
ECOMMENDED SKIN PROTECTION***
GAUNTLET-TYPE RUBBER GLOVES,CHEMICAL RESISTANT APRON
WASH OFF AFTER EACH USE REPLACE AS NECESSARY.
ECOMMENDED EYE PROTECTION***
SPLASH PROOF CHEMICAL GOGGLES.FACE SHIELD

----SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------
TORAGE INSTRUCTIONS***
KEEP CONTAINERS CLOSED WHEN NOT IN USE.
DO NOT STORE AT ELEVATED TEMPERATURES.KEEP AWAY FROM FLAME OR SPARKS
ANDLING INSTRUCTIONS***
COMBUSTIBLE. DO NOT USE AROUND SPARKS OR FLAMES. BOND CONTAINERS DURING
FILLING OR DISCHARGE WHEN PERFORMED AT TEMPERATURES AT OR ABOVE THE
PRODUCT FLASH POINT.

****

HIS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD

****

APPENDIX: REGULATORY INFORMATION

HE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
FFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
NY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

..TSCA: THIS IS AN EPA REGISTERED BIOCIDE AND IS EXEMPT FROM TSCA INVENTORY
EQUIREMENTS
..FIFRA(40CFR):EPA REG.NO.: 3876- 145
..REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
0.4 GALLONS DUE TO ETHYLENE GLYCOL;
..RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE
DENTIFICATION NUMBER IS:D001=IGNITABLE;D002=CORROSIVE(SKIN)
..DOT HAZARD/UN#/ER GUIDE# IS :CORROSIVE TO SKIN.COMBUSTIBLE/UN1760/#60
..CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS:NONE
..SARA SECTION 302 CHEMICALS:NONE
..SARA SECTION 313 CHEMICALS: ETHYLENE GLYCOL(CAS# 107-21-1), 21.0-30.0%
..SARA SECTION 312 HAZARD CLASS:IMMEDIATE(ACUTE);DELAYED(CHRONIC);FIRE
..MICHIGAN CRITICAL MATERIALS: NONE
NFPA/HMIS : HEALTH - 3; FIRE - 2; REACTIVITY - 0; SPECIAL - CORR; PE - D

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: CLAM-TROL CT-1 May 17, 1994

AQUATIC TOXICOLOGY

Rainbow Trout 96 Hour Flow-Thru Bioassay

LC50: 8.1 mg/L
No Effect Level: 6.5

Fathead Minnow 96 Hour Flow-Thru Bioassay

LC50: 3.7 mg/L
No Effect Level: 2.1

Daphnia magna 48 Hour Flow-Thru Bioassay

LC50: 0.2 mg/L
No Effect Level: 0.135

Ceriodaphnia 48 Hour Flow-Thru Bioassay

LC50: 0.14 mg/L
No Effect Level: 0.05

Mysid Shrimp 96 Hour Flow-Thru Bioassay

LC50: 0.34 mg/L
No Effect Level: 0.1

BIODEGRADATION

COD (mg/gm): 1095 Calculated
TOC (mg/gm): 295 Calculated

BOD-5 (mg/gm): 21 Calculated
BOD-28 (mg/gm): 242 Calculated

Closed Bottle Test
% Degradation in 28 days: 45 Calculated

Zahn-Wellens Test
% Degradation in 28 days: 49 Calculated

MAMMALIAN TOXICOLOGY

Oral LD50 RAT: 3,270 MG/KG

Dermal LD50 RABBIT: >2,000 MG/KG

Skin Irritation Score RABBIT: 5.13

Eye Irritation Score RABBIT: 103
Note - MAX UNWASHED (DAY 14); MAX WASHED VALUE:101 (DAY 14)

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

PRODUCT : BETZ DTS

EFFECTIVE DATE 11-13-9
PRINTED: 13-Nov-1991
REVISIONS TO SECTIONS: 1

PRODUCT APPLICATION : A DETOXIFYING AGENT.

-----SECTION 1----------HAZARDOUS INGREDIENTS----------

INFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION. THIS PRODUCT IS SUBJECT TO THE PENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

RESPIRABLE QUARTZ(CRYSTALLINE SILICA)***CAS#14808-60-7;SUSPECT HUMAN CARCINOGEN (IARC=2A);MAY CAUSE LONG TERM LUNG DISEASE(SILICOSIS); RESPIRATORY IRRITANT;PEL/TLV:0.1MG/M3.
RESPIRABLE CRISTOBALITE(CRYSTALLINE SILICA)***CAS#14464-46-1;SUSPECT HUMAN CARCINOGEN(IARC=2A);MAY CAUSE LONG TERM LUNG DISEASE (SILICOSIS); RESPIRATORY IRRITANT;PEL/TLV:0.05MG/M3.
RESPIRABLE TRIDYMITE(CRYSTALLINE SILICA)***CAS#15468-32-3;SUSPECT HUMAN CARCINOGEN(IARC=2A);MAY CAUSE LONG TERM LUNG DISEASE(SILICOSIS); RESPIRATORY IRRITANT;PEL/TLV:0.05MG/M3.
TRIETHANOLAMINE***CAS#102-71-6;IRRITANT;POTENTIAL LIVER AND KIDNEY TOXIN; PEL/TLV:NONE.

NONHAZARD INGREDIENTS: WATER(7732-18-5) ; BENTONITE(1302-78-9) ; 2-PROPENOIC ACID, HOMOPOLYMER(9003-01-4)

-----SECTION 2----------TYPICAL PHYSICAL DATA----------

PH: AS IS (APPROX.) 5.9	ODOR: SLIGHT
FL.PT.(DEG.F): >200 P-M(CC)	SP.GR.(70F)OR DENSITY: 1.142
VAPOR PRESSURE(mmHG): 18	VAPOR DENSITY(AIR=1): <1
VISC cps70F: 2,000	%SOLUBILITY(WATER): 0
EVAP.RATE: ND WATER=1	APPEARANCE: GREEN-BROWN
PHYSICAL STATE: LIQUID	FREEZE POINT(DEG.F): 32

-----SECTION 3----------REACTIVITY DATA----------

STABLE. BETZ TANK CLEAN-OUT CATEGORY 'B'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

ODUCT: BETZ DTS

---SECTION 4----------HEALTH HAZARD EFFECTS----------

UTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
SLIGHTLY IRRITATING TO THE SKIN
EYE EFFECTS ***
MODERATELY IRRITATING TO THE EYES
UTE RESPIRATORY EFFECTS ***
MISTS/AEROSOLS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT
RONIC EFFECTS OF OVEREXPOSURE***
PROLONGED OR REPEATED EXPOSURES MAY CAUSE LIVER AND KIDNEY TOXICITY.
DICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

MPTOMS OF EXPOSURE ***
MAY CAUSE REDNESS OR ITCHING OF SKIN.

---SECTION 5----------FIRST AID INSTRUCTIONS----------

IN CONTACT***
REMOVE CONTAMINATED CLOTHING.WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES
E CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT
HALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR.APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY
GESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DILUTE CONTENTS OF STOMACH.INDUCE VOMITING BY ONE OF THE STANDARD METHODS.IMMEDIATELY CONTACT A PHYSICIAN

---SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS---------

ILL INSTRUCTIONS***
VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL, SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD SAND/GRIT.
SPOSAL INSTRUCTIONS***
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN.ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
INCINERATE OR BURY IN APPROVED LANDFILL
RE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA: DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

'P^DUCT: BETZ DTS
-SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------
'SE PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE
.ESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
'ENTILATION PROTECTION***
ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS
:ECOMMENDED RESPIRATORY PROTECTION***
IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH DUST/MIST FILTERS.
:ECOMMENDED SKIN PROTECTION***
RUBBER GLOVES
WASH OFF AFTER EACH USE.REPLACE AS NECESSARY
:ECOMMENDED EYE PROTECTION***
SPLASH PROOF CHEMICAL GOGGLES

----SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------.

:TORAGE INSTRUCTIONS***
KEEP DRUMS & PAILS CLOSED WHEN NOT IN USE.
DO NOT FREEZE.IF FROZEN,THAW AND MIX COMPLETELY PRIOR TO USE
(ANDLING INSTRUCTIONS***
NORMAL CHEMICAL HANDLING
****
'HIS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD
****
APPENDIX: REGULATORY INFORMATION
:I CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
:F.LCTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
.NY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

..TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE TSCA INVENTORY
..REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
'REAT AS OIL SPILL
..RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE
:DENTIFICATION NUMBER IS: NOT APPLICABLE
..DOT HAZARD/UN#/ER GUIDE# IS: NOT APPLICABLE
..CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS: NONE
..SARA SECTION 302 CHEMICALS: NONE
..SARA SECTION 313 CHEMICALS:-NONE
..SARA SECTION 312 HAZARD CLASS: IMMEDIATE(ACUTE)
..MICHIGAN CRITICAL MATERIALS: NONE
(FPA/HMIS : HEALTH - 1 ; FIRE - 1 ; REACTIVITY - 0 ; SPECIAL - NONE ; PE - B

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: BETZ DTS May 17, 1994

AQUATIC TOXICOLOGY

Fathead Minnow 96 Hour Static Screen

0% Mortality: 435 mg/L

Daphnia magna 48 Hour Static Screen

0% Mortality: 435 mg/L

BIODEGRADATION

NO DATA AVAILABLE

MAMMALIAN TOXICOLOGY

Oral LD50 RAT: >2,000 MG/KG
Note - ESTIMATED VALUE

Dermal LD50 RABBIT: >2,000 MG/KG
Note - ESTIMATED VALUE

Betz Industrial
The Water Management Division of Betz Laboratories, Inc

product facts

BETZ® COPPER-TROL™ Cu-1 INHIBITOR

- **Inhibits corrosion of copper and copper alloys**
- **Provides long-lasting protection**
- **Applicable to once-through and recirculating cooling water systems**

DESCRIPTION AND USE

Betz Copper-Trol Cu-1 is a cooling water corrosion inhibitor specifically designed to establish a long-lasting protective film on copper and copper alloys. The purchase of this product from Betz provides a license under U.S. Patent 4,744,950.

TYPICAL APPLICATIONS

Betz Copper-Trol Cu-1 is designed for once-through and recirculating cooling water systems. It is shot fed to establish a film that protects the metal surface for two to six weeks. This product also indirectly inhibits the corrosion of mild steel when that corrosion is due to a galvanic cell between the mild steel and products of copper corrosion.

TREATMENT AND FEEDING REQUIREMENTS

Dosage. Treatment levels of Betz Copper-Trol Cu-1 depend on many factors specific to each location. Your Betz Industrial representative will establish specific guidelines for your system. The normal dosage is 50 ppm, based on recirculation rate, applied every two to six weeks, depending on film persistence. Betz Copper-Trol Cu-1 should be shot fed to a circulating system or fed continuously for 10 to 15 minutes in a once-through system.

Feed point. Betz Copper-Trol Cu-1 should be fed to a point in the system where conditions (turbulence, flow patterns, etc.) ensure good mixing of the product in the water to be treated.

Dilution. Betz Copper-Trol Cu-1 may be fed directly from the shipping container or diluted with good quality water to a convenient feeding strength.

Feed equipment. Mild steel, stainless steel, Polypropylene, Polyethylene, PVC, Teflon, and Hypalon tanks, pumps, and piping are compatible with this product.

Chlorine. This product is degraded by chlorine. The level of chlorination directly affects the persistence of the protective film. It should not be fed concurrently with chlorine. Between applications free chlorine residuals should not routinely exceed 0.4 ppm.

GENERAL PROPERTIES

Appearance	brown-black liquid
Density at 70 °F (21 °C)	9.86 lb/gal (1.18 kg/L)
Flash Point (closed cup)	>200 °F (93 °C)
Freeze Point (ASTM))	–4 °F (–20 °C
pH (undiluted)	13.5
Specific Gravity at 70°F (21°C)	1.184
Viscosity at 70°F (21°C)	37 cP

STORAGE

Protect Copper-Trol Cu-1 from freezing. If it freezes during shipping or storage, mix this product to ensure homogeneity.

SAFETY PRECAUTIONS

A Material Safety Data Sheet containing detailed information relative to this product is available upon request.

PACKAGING INFORMATION

Betz Copper-Trol Cu-1 is blended as a liquid and is available in 55-gal (208-L) bung-type, nonretumable drums. Approximate net weight is 520 lb (236 kg) per drum. In addition, Betz Copper-Trol Cu-1 is available under the Betz Point Of Feed® and Betz Semi-Bulk Control™ Service Programs for contracted quantities in certain geographic areas.

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

ODUCT : COPPER-TROL CU-1
EFFECTIVE DATE 10-22-91
PRINTED: 4-Jun-1992
REVISIONS TO SECTIONS: 1

ODUCT APPLICATION : WATER-BASED CORROSION INHIBITOR.
---SECTION 1----------HAZARDOUS INGREDIENTS----------

FORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC ODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS STED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE D CHRONIC HAZARDS OF THIS FORMULATION. THIS PRODUCT IS SUBJECT TO THE NNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

SODIUM HYDROXIDE(CAUSTIC SODA)***CAS#1310-73-2;CORROSIVE;TOXIC(IF ORALLY INGESTED);PEL:2.0MG/M3;TLV:2.0MG/M3(CEILING).

BUTYL BENZOTRIAZOLE,SODIUM SALT***CAS#118685-34-0;SKIN SENSITIZER; CORROSIVE TO SKIN AND EYES;PEL:NONE;TLV:NONE.

NHAZARD INGREDIENTS: WATER(7732-18-5)

---SECTION 2----------TYPICAL PHYSICAL DATA----------
: AS IS (APPROX.) 13.5ODOR: MILD
.PT.(DEG.F): >200 P-M(CC) SP.GR.(70F)OR DENSITY: 1.184
POR PRESSURE(mmHG): 22 VAPOR DENSITY(AIR=1): <1
SC cps70F: 37 %SOLUBILITY(WATER): 100
AP.RATE: <1 ETHER=1 APPEARANCE: BROWN-BLACK
YSICAL STATE: LIQUID FREEZE POINT(DEG.F): -4
---SECTION 3----------REACTIVITY DATA----------

ABLE.MAY REACT WITH ACIDS.DO NOT CONTAMINATE. BETZ TANK CLEAN-OUT TEGORY 'C'

ERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

PRODUCT: COPPER-TROL CU-1

-----SECTION 4----------HEALTH HAZARD EFFECTS----------

ACUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
CORROSIVE TO SKIN.SKIN SENSITIZER

JE EYE EFFECTS ***
CORROSIVE TO THE EYES

ACUTE RESPIRATORY EFFECTS ***
MISTS/AEROSOLS CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

CHRONIC EFFECTS OF OVEREXPOSURE***
PROLONGED OR REPEATED CONTACT MAY CAUSE TISSUE NECROSIS,DERMATITIS AND/OR SKIN SENSITIZATION.

MEDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

SYMPTOMS OF EXPOSURE ***
CAUSES SEVERE IRRITATION,BURNS OR TISSUE ULCERATION WITH SUBSEQUENT SCARRING.

PRECAUTIONARY STATEMENT BASED ON TESTING RESULTS ***
MAY BE TOXIC IF ORALLY INGESTED.

-----SECTION 5----------FIRST AID INSTRUCTIONS----------

SKIN CONTACT***
REMOVE CLOTHING.WASH AREA WITH LARGE AMOUNTS OF SOAP SOLUTION OR WATER FOR 15 MIN.IMMEDIATELY CONTACT PHYSICIAN

EYE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA.APPLY NECESSARY FIRST AID TREATMENT.IMMEDIATELY CONTACT A PHYSICIAN.

INGESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DO NOT INDUCE VOMITING.IMMEDIATELY CONTACT PHYSICIAN. DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER

-----SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS---------

SPILL INSTRUCTIONS***
VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL, SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS***
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

ODU[redacted] COPPER-TROL CU-1
-SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------
E PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE
SPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
NTILATION PROTECTION***
ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS
COMMENDED RESPIRATORY PROTECTION***
IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH DUST/MIST FILTERS.
COMMENDED SKIN PROTECTION***
GAUNTLET-TYPE RUBBER GLOVES,CHEMICAL RESISTANT APRON
WASH OFF AFTER EACH USE.REPLACE AS NECESSARY
COMMENDED EYE PROTECTION***
SPLASH PROOF CHEMICAL GOGGLES.FACE SHIELD

---SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------

ORAGE INSTRUCTIONS***
KEEP DRUMS & PAILS CLOSED WHEN NOT IN USE.
DO NOT FREEZE.IF FROZEN,THAW AND MIX COMPLETELY PRIOR TO USE
NDLING INSTRUCTIONS***
ALKALINE.CORROSIVE(SKIN/EYES).DO NOT MIX WITH ACIDIC MATERIAL.
****
IS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD
****

APPENDIX: REGULATORY INFORMATION

CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
CTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
Y CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE TSCA INVENTORY
REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
0 GALLONS DUE TO SODIUM HYDROXIDE
RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE
ENTIFICATION NUMBER IS: D002=CORROSIVE(SKIN,PH)
DOT HAZARD/UN#/ER GUIDE# IS: CORROSIVE TO SKIN UN1824/#60
CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS: NONE
SARA SECTION 302 CHEMICALS: NONE
SARA SECTION 313 CHEMICALS: NONE
SARA SECTION 312 HAZARD CLASS: IMMEDIATE(ACUTE) AND DELAYED(CHRONIC)
MICHIGAN CRITICAL MATERIALS: NONE
PA/HMIS : HEALTH - 3 ; FIRE - 1 ; REACTIVITY - 0 ; SPECIAL - CORR ; PE - D

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: COPPER-TROL CU-1 May 17, 1994

AQUATIC TOXICOLOGY

Rainbow Trout 96 Hour Static Acute Bioassay

LC50: 28.1 mg/L
No Effect Level: 21

Fathead Minnow 96 Hour Static Acute Bioassay

LC50: 60.6 mg/L
No Effect Level: 49

Daphnia magna 48 Hour Static Acute Bioassay

LC50: 112.5 mg/L
No Effect Level: 65

BIODEGRADATION

COD (mg/gm): 269 Calculated
TOC (mg/gm): 85 Calculated

BOD-5 (mg/gm): 7 Calculated
BOD-28 (mg/gm): 7 Calculated

Closed Bottle Test
% Degradation in 28 days: 1 Calculated

Zahn-Wellens Test
% Degradation in 28 days: 13 Calculated

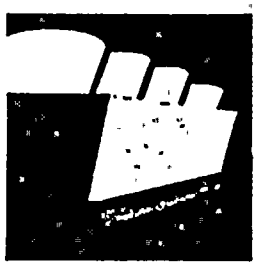
MAMMALIAN TOXICOLOGY

Oral LD50 RAT: 945 MG/KG
Note - ESTIMATED VALUE

Dermal LD50 RABBIT: >5,000 MG/KG
Note - ESTIMATED VALUE

BETZ Industrial

product facts



BETZ® SLIMICIDE C-68

- **Designed for Air Washers, Recirculating Cooling Towers and Brewery Pasteurizers**
- **Effective Against Bacterial, Fungal, and Algal Fouling**
- **Compatible with BETZ Corrosion Inhibitors**

DESCRIPTION AND USE

BETZ Slimicide C-68 is a liquid biocide that aids in the control of bacterial, fungal and algal slimes in evaporative condensers, heat exchange water systems, commercial and industrial cooling towers, industrial water scrubbing systems, brewery pasteurizers, and air washers.

TREATMENT AND FEEDING REQUIREMENTS

DOSAGE—Proper treatment levels for BETZ Slimicide C-68 depend on many factors such as the type of system being treated, the nature and degree of severity of the microbiological problem, system retention time, temperature, pH, and other operating conditions. Systems which are heavily contaminated should be cleaned first. BETZ Slimicide C-68 should be applied to the clean system or when slime growth is first noticed, according to the following schedule.

For the initial dose, when the system is noticeably fouled, apply 148 to 883 ppm Slimicide C-68 (1.26 to 7.46 pounds or 19 to 113 fluid ounces of Slimicide C-68 per 1000 gallons of water in the system). Repeat until control is achieved.

For subsequent doses, when microbial control is evident, add 35 to 219 ppm Slimicide C-68 (0.3 to 1.86 pounds or 4.5 to 28 fluid ounces of Slimicide C-68 per 1000 gallons of water in the system) weekly or as needed to maintain control.

Badly fouled systems must be cleaned before treatment is begun.

FEED POINT

BETZ Slimicide C-68 can be fed directly from the drum or diluted with water and fed by any suitable feed system. BETZ Slimicide C-68 should be dosed directly into the sump or basin or any other location where good distribution can be assured.

In treating air washer systems, BETZ Slimicide C-68 should be added to the air washer sump or chill water sump, to insure uniform mixing.

FEED EQUIPMENT

Slimicide C-68 is compatible with most plastics, fiber glass, ceramic, and Teflon feed equipment. Also 316 stainless steel is generally acceptable. Mild steel, copper, and brass lines and equipment should be avoided.

GENERAL PROPERTIES

5-Chloro-2-Methyl-4-Isothiazolin-3-One	1.15%
2-Methyl-4-Isothiazolin-3-One	0.35%
Inert Ingredients	98.50%
EPA Registration No.	3876-143
Appearance	light yellow to green liquid
Density (70 °F)	8.6 lb/gal
Flash Point (open cup)	>200 °F
Freeze Point	28 °F
pH (undiluted)	3.5
Specific Gravity (70 °F)	1.033
Solubility in Water	complete
Viscosity (70 °F)	3.1 cP

SAFETY PRECAUTIONS

A Material Safety Data Sheet containing detailed information relative to this product is available upon request.

PACKAGING INFORMATION

BETZ Slimicide C-68 is blended as liquid, supplied in 55-gallon, non-returnable white head low density polyethylene insert drums. Approximate net weight—460 lbs. per drum.

In addition, Slimicide C-68 is available under BETZ Point of Feed® Service Program for contracted quantities in certain geographic areas.

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

PRODUCT : SLIMICIDE C-68

EFFECTIVE DATE:11-03-92
PRINTED: 11-03-92

REVISIONS TO SECTIONS: APPENDIX

PRODUCT APPLICATION:WATER-BASED MICROBIAL CONTROL AGENT.

-----SECTION 1----------HAZARDOUS INGREDIENTS----------

INFORMATION ON PHYSICAL HAZARDS,HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION.THIS PRODUCT IS SUBJECT TO THE PENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

MAGNESIUM NITRATE***CAS# 10377-60-3;OXIDIZER;EYE AND SKIN IRRITANT; PEL:NONE;TLV:NONE;

5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE***CAS# 26172-55-4; CORROSIVE;SKIN SENSITIZER;TOXIC(ORAL AND DERMAL EXPOSURE); PEL:NONE;TLV:NONE; NOTE-(MFG.SUGGESTED EXPOSURE LIMIT:0.1MG/M3 FOR TOTAL ISOTHIAZOLONES).

NONHAZARD INGREDIENTS: WATER(CAS# 7732-18-5)

-----SECTION 2----------TYPICAL PHYSICAL DATA----------

PH: AS IS(APPROX.) 3.5	ODOR: AROMATIC
FL.PT.(DEG.F):> 200 P-M(CC)	SP.GR.(70F): 1.033
VAPOR PRESSURE(mmHG): 20.0	VAPOR DENSITY(AIR=1): < 1.00
VISC cps70F: 3	%SOLUBILITY(WATER): 100.0
EVAP RATE: < 1.00(ETHER=1)	APPEARANCE: LIGHT YELLOW TO GREEN
PHYSICAL STATE:LIQUID	FREEZE POINT(DEG.F): 28.00

-----SECTION 3----------REACTIVITY DATA----------

STABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK CLEAN-OUT CATEGORY 'B'

THERMAL DECOMPOSTION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

PRODUCT : SLIMICIDE C-68

----SECTION 4---------HEALTH HAZARD EFFECTS----------

SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
CORROSIVE TO SKIN;SKIN SENSITIZER WITH DELAYED ONSET OF SYMPTOMS.

ACUTE EYE EFFECTS ***
CORROSIVE TO THE EYES

ACUTE RESPIRATORY EFFECTS ***
MISTS/AEROSOLS CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

CHRONIC EFFECTS OF OVEREXPOSURE***
PROLONGED OR REPEATED CONTACT MAY CAUSE TISSUE NECROSIS AND SKIN SENSITIZATION.

MEDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

SYMPTOMS OF EXPOSURE ***
DIRECT CONTACT WITH SKIN WILL CAUSE SEVERE DELAYED SKIN REACTIONS OR BURNS IF NOT WASHED OFF IMMEDIATELY-FOLLOW FIRST AID INSTRUCTIONS.

----SECTION 5----------FIRST AID INSTRUCTIONS----------

SKIN CONTACT ***
REMOVE CLOTHING.WASH AREA WITH LARGE AMOUNTS OF SOAP SOLUTION OR WATER FOR 15 MIN.IMMEDIATELY CONTACT PHYSICIAN

EYE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA.APPLY NECESSARY FIRST AID TREATMENT.IMMEDIATELY CONTACT A PHYSICIAN.

INGESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DO NOT INDUCE VOMITING.IMMEDIATELY CONTACT PHYSICIAN. DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER

---SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS----------

SPILL INSTRUCTIONS***
VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBANT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER.THE CONTAMINATED ABSORBANT SHOULD BE CONSIDERED A PESTICIDE AND DISPOSED OF IN AN APPROVED PESTICIDE LANDFILL.SEE DECONTAMINATE WITH 10% SOD.BISULFITE.USE 15 PARTS TO 1 PART PRODUCT

DISPOSAL INSTRUCTIONS****
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
DISPOSE OF IN APPROVED PESTICIDE FACILITY OR ACCORDING TO LABEL INSTRUCTIONS

FIRE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

PRODUCT : SLIMICIDE C-68

-----SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------

PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134.USE RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.

VENTILATION PROTECTION***

ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS

RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY, USE RESPIRATOR WITH ORGANIC VAPOR,ACID GASSES & DUST/MIST CARTRIDGES

RECOMMENDED SKIN PROTECTION***

GAUNTLET-TYPE NEOPRENE GLOVES,CHEMICAL RESISTANT APRON

WASH OFF AFTER EACH USE REPLACE AS NECESSARY.

RECOMMENDED EYE PROTECTION***

SPLASH PROOF CHEMICAL GOGGLES.FACE SHIELD

-----SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------

STORAGE INSTRUCTIONS***

KEEP CONTAINERS CLOSED WHEN NOT IN USE.

DO NOT FREEZE.IF FROZEN,THAW AND MIX COMPLETELY PRIOR TO USE

HANDLING INSTRUCTIONS***.

CORROSIVE TO SKIN.CORROSIVE TO EYES.

****

THIS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD

****

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE. ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

TSCA: THIS IS AN EPA REGISTERED BIOCIDE AND IS EXEMPT FROM TSCA INVENTORY ... JIREMENTS

...FIFRA(40CFR):EPA REG.NO.: 3876- 143

...USDA FEDERALLY INSPECTED MEAT AND POULTRY PLANTS-AUTHORIZED CAT.: SEC.G7

...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:

NOT APPLICABLE

...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE IDENTIFICATION NUMBER IS:D002=CORROSIVE(SKIN)

...DOT HAZARD/UN#/ER GUIDE# IS :CORROSIVE TO SKIN/UN1760/#60

...CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS:NONE

...SARA SECTION 302 CHEMICALS:NONE

...SARA SECTION 313 CHEMICALS:NONE

...SARA SECTION 312 HAZARD CLASS:IMMEDIATE(ACUTE);DELAYED(CHRONIC)

...MICHIGAN CRITICAL MATERIALS: NONE

NFPA/HMIS : HEALTH - 3; FIRE - 1; REACTIVITY - 0; SPECIAL - CORR; PE - D

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: SLIMICIDE C-68 May 17, 1994

AQUATIC TOXICOLOGY

Rainbow Trout 96 Hour Static Acute Bioassay

LC50: 8.7 mg/L
No Effect Level: 6.5

Daphnia magna 48 Hour Static Acute Bioassay

LC50: 6.6 mg/L
No Effect Level: 4.9

Bluegill Sunfish 96 Hour Static Acute Bioassay

LC50: 12.1 mg/L
No Effect Level: 6.5

BIODEGRADATION

COD (mg/gm): 14 Calculated
TOC (mg/gm): 9 Calculated

BOD-5 (mg/gm): 0 Calculated
BOD-28 (mg/gm): 0 Calculated

Closed Bottle Test
% Degradation in 28 days: 0 Calculated

Zahn-Wellens Test
% Degradation in 28 days: 0 Calculated

MAMMALIAN TOXICOLOGY

Oral LD50 RAT: >5,000 MG/KG

Skin Sensit. Patch HUMAN: POSITIVE

Non-Ames Mutagenicity : NEGATIVE

Teratology : NEGATIVE

Dermal LD50 RABBIT: >2,000 MG/KG
Note - ESTIMATED VALUE

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

PRODUCT : POWERLINE 3625

EFFECTIVE DATE:05-14-9
PRINTED: 05-14-93

REVISIONS TO SECTIONS: 1

PRODUCT APPLICATION:BIOCIDE

-----SECTION 1----------HAZARDOUS INGREDIENTS----------

INFORMATION ON PHYSICAL HAZARDS,HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION.THIS PRODUCT IS SUBJECT TO THE PENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

(C12-16)ALKYL DIMETHYL BENZYL AMMONIUM CHLORIDE***CAS# 68424-85-1; CORROSIVE(SKIN AND EYES); PEL:NOT DETERMINED;TLV:NOT DETERMINED

ETHYL ALCOHOL(ETHANOL)***CAS# 64-17-5;FLAMMABLE;EYE IRRITANT;MAY CAUSE DEFATTING DERMATITIS,DIZZINESS AND HEADACHE;PEL:1000PPM;TLV:1000PPM

NONHAZARD INGREDIENTS: WATER(CAS# 7732-18-5)

-----SECTION 2----------TYPICAL PHYSICAL DATA----------

PH: AS IS(APPROX.) 8.9	ODOR: MILD
FL.PT.(DEG.F): 130 P-M(CC)	SP.GR.(70F): 0.965
VAPOR PRESSURE(mmHG): 44.0	VAPOR DENSITY(AIR=1): < 1.00
VISC cps70F: 73	%SOLUBILITY(WATER): 100.0
EVAP RATE: > 1.00(ETHER=1)	APPEARANCE: COLORLESS TO YELLOW
PHYSICAL STATE:LIQUID	FREEZE POINT(DEG.F): -7.00

-----SECTION 3----------REACTIVITY DATA----------

STABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK CLEAN-OUT CATEGORY 'B'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

RODUCT : POWERLINE 3625

--SECTION 4---------HEALTH HAZARD EFFECTS----------

JTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
SEVERE IRRITANT TO THE SKIN.POTENTIAL SKIN SENSITIZER

CUTE EYE EFFECTS ***
CORROSIVE TO THE EYES

CUTE RESPIRATORY EFFECTS ***
VAPORS,GASES,MISTS AND/OR AEROSOLS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT.

HRONIC EFFECTS OF OVEREXPOSURE***
REPEATED SKIN CONTACT MAY CAUSE SENSITIZATION.

EDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

YMPTOMS OF EXPOSURE ***
INHALATION OF VAPORS/MISTS/AEROSOLS MAY CAUSE EYE,NOSE,THROAT AND LUNG IRRITATION;SKIN CONTACT MAY CAUSE SEVERE IRRITATION OR BURNS.

RECAUTIONARY STATEMENT BASED ON TESTING RESULTS ***
MAY BE TOXIC IF ORALLY INGESTED.

----SECTION 5----------FIRST AID INSTRUCTIONS----------

KIN CONTACT ***
REMOVE CLOTHING.WASH AREA WITH LARGE AMOUNTS OF SOAP SOLUTION OR WATER FOR 15 MIN.IMMEDIATELY CONTACT PHYSICIAN

YE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

NHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA.APPLY NECESSARY FIRST AID TREATMENT.IMMEDIATELY CONTACT A PHYSICIAN.

NGESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DO NOT INDUCE VOMITING.IMMEDIATELY CONTACT PHYSICIAN. DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER

---SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS----------

PILL INSTRUCTIONS***
VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBANT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER.THE CONTAMINATED ABSORBANT SHOULD BE CONSIDERED A PESTICIDE AND DISPOSED OF IN AN APPROVED PESTICIDE LANDFILL.SEE PRODUCT LABEL STORAGE AND DISPOSAL INSTRUCTIONS.
REMOVE IGNITION SOURCES.FLUSH AREA WITH WATER.SPREAD SAND/GRIT.

ISPOSAL INSTRUCTIONS****
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
DISPOSE OF IN APPROVED PESTICIDE FACILITY OR ACCORDING TO LABEL INSTRUCTIONS

IRE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

PRODUCT : POWERLINE 3625

---SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------

. PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134.USE RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.

VENTILATION PROTECTION***

ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS

RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY, USE A RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE & DUST/MIST PREFILTER

RECOMMENDED SKIN PROTECTION***

RUBBER GLOVES

WASH OFF AFTER EACH USE REPLACE AS NECESSARY.

RECOMMENDED EYE PROTECTION***

SPLASH PROOF CHEMICAL GOGGLES

-----SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------

STORAGE INSTRUCTIONS***

KEEP CONTAINERS CLOSED WHEN NOT IN USE.

KEEP AWAY FROM FLAMES OR SPARKS. BOND CONTAINERS DURING FILLING OR DISCHARGE WHEN PERFORMED AT TEMPERATURES AT OR ABOVE THE PRODUCT FLASH POINT.

HANDLING INSTRUCTIONS***

COMBUSTIBLE. DO NOT USE AROUND SPARKS OR FLAMES. BOND CONTAINERS DURING FILLING OR DISCHARGE WHEN PERFORMED AT TEMPERATURES AT OR ABOVE THE PRODUCT FLASH POINT.

****

THIS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD

****

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE. ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

...TSCA: THIS IS AN EPA REGISTERED BIOCIDE AND IS EXEMPT FROM TSCA INVENTORY REQUIREMENTS

...FIFRA(40CFR):EPA REG.NO.: 10324-42-3876

...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:

NOT APPLICABLE

...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE IDENTIFICATION NUMBER IS:D001=IGNITABLE

...DOT HAZARD/UN#/ER GUIDE# IS :COMBUSTIBLE LIQUID/NA1993/#27

...CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS:NONE

...SARA SECTION 302 CHEMICALS:NONE

...SARA SECTION 313 CHEMICALS:NONE

...SARA SECTION 312 HAZARD CLASS:IMMEDIATE(ACUTE);DELAYED(CHRONIC);FIRE

...MICHIGAN CRITICAL MATERIALS: NONE

NFPA/HMIS : HEALTH - 3; FIRE - 2; REACTIVITY - 0; SPECIAL - NONE; PE - B

May 18, 1994

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053

Product: Powerline 3625

AQUATIC TOXICOLOGY

Fresh Water Organisms

Species	Test Conditions	LC50*	No Effect Level
Daphnia magna	48 Hour Flow-Through	0.04 mg/l	0.025 mg/l
Fathead Minnow	96 Hour Flow-Through	0.73 mg/l	0.25 mg/l
Rainbow Trout	96 Hour Flow-Through	2.0 mg/l	1.0 mg/l

*These LC50 values represent analytically measured levels

Marine Organisms

Species	Test Conditions	LC50*
Mysid Shrimp	96 Hour Flow-Through	0.16 mg/l
Inland Silverside	96 Hour Flow-Through	0.62 mg/l
Sheapshead Minnow	96 Hour Flow-Through	1.76 mg/l

*These LC50 values represent analytically measured levels

MAMMALIAN TOXICOLOGY

Oral LD50 RAT: 445 mg/kg

Note: Estimated value based on test results on active ingredient

Dermal LD50 Rabbit: >1,800 mg/kg

Note: Estimated value based on test results on active ingredient

ROUSSEL BI
CORPORATIC

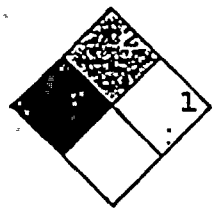
ROUSSEL BIO CORPORATION
170 BEAVER BROOK ROAD
LINCOLN PARK, NJ 07035
Emergency Telephone 800-331-2867

1261. Page 1 of

NFPA Designation 704

DEGREE OF HAZARD
4=EXTREME
3=HIGH
2=MODERATE
1=SLIGHT
0=INSIGNIFICANT

HEALTH (BLUE)



FLAMMABILITY (RED)

REACTIVIT (YELLOW)

SPECIAL HAZARD

MATERIAL SAFETY DATA SHEET DATE May 15, 199

Section I - Product Identification

Product Name: Nusyn-Noxfish Fish Toxicant
EPA Reg. No: 432-550
Chemical Name: (R)-1,2-dihydro-8,9-dimethoxy-2-(1-methylethenyl)[1
benzopyrano[3,4--b]furo[2,3-h][1]benzopyran-6,12-
dione (9Cl)
Common Name: Rotenone
Molecular Formula: $C_{23}H_{22}O_6$
Molecular Weight: 394.4

Section II - Precautionary Statement

Health:

DANGER! KEEP OUT OF REACH OF CHILDREN. Fatal if inhaled. Do not breathe spray mist. Wear an approved pesticide respirator when mixing or applying as a spray. May be fatal if swallowed. Causes substantial but temporary eye irritation. Do not get in eyes, on skin or on clothing. Wear protective goggles, faceshield, or safety glasses. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

Environment:

This product is extremely toxic to fish. Fish kills are expected at recommended rates. Consult your State Fish and Game Agency before applying this product to public waters to determine if a permit is needed for such an application. Do not contaminate untreated water when disposing of equipment washwaters.

Do not decontaminate personnel or equipment, or handle broken packages or containers without protective equipment as specified in the Exposure Control Section. Decontaminate emergency personnel with soap and water before leaving the fire area.

Avoid breathing dusts, vapors and fumes from burning materials. Control run-off water - if water enters a drainage system, advise the authorities downstream.

Section VI - Reactivity Data

Stability:	Stable
Polymerization:	Will not occur
Conditions to avoid:	Keep away from excessive heat and any sources of ignition.
Incompatible Materials:	Strong oxidizing and reducing agents.
Hazardous Decomposition Products:	Carbon monoxide and/or carbon dioxide.

Section VII - Health Hazard Information

TOXICITY DATA AND EFFECTS OF OVEREXPOSURE:

Eye contact:	Moderately irritating to the eye
Skin contact:	Slightly irritating to the skin
Skin Absorption:	LD50 (rabbit) >2020 mg/kg
Inhalation:	4 Hour LC50 (rat) - 0.049 mg/l
Ingestion:	LD50 (rat) - 561 mg/kg

TOXICITY DATA AND EFFECTS OF THE ACTIVE INGREDIENT:

Mutagenicity:
A battery of mutagenicity studies designed to detect gene mutations, chromosomal aberrations and mitotic recombination or mitotic gene conversation were negative and revealed no potential for rotenone to induce mutagenic changes in vivo or in vitro.

Teratogenicity:
No teratogenic or fetotoxic effects were found when tested in both rats and mice.

Carcinogenicity:
No evidence of oncogenicity was observed in chronic feeding studies with mice, rats and hamsters.

EPA Reg.No.: 432-550
Date: May 15, 1990

EMERGENCY AND FIRST AID PROCEDURES:

If on skin: Wash with plenty of soap and water. Get medical attention if irritation persists.

If in eyes: Flush with plenty of water. Get medical attention if irritation persists.

If ingested: Call a physician or Poison Control Center. Promptly drink a large quantity of milk, egg whites, or gelatin solution. If these are not available, drink large quantities of water. Avoid alcohol. Do not induce vomiting. Get medical attention immediately. Never give anything by mouth to an unconscious person.

If inhaled: Remove to fresh air. If breathing is difficult or if any discomfort persists, obtain medical attention. If breathing has stopped, give artifical respiration, preferably mouth to mouth. Get medical attention immediately.

NOTES TO PHYSICIAN:

This product is highly toxic when spray mist is inhaled, moderately toxic by the oral route and slightly toxic by the dermal route. This product causes substantial but reversible eye irritation. Initial treatment is removal of exposure by washing, emesis or lavage and is followed by symptomatic and supportive care.

MEDICAL CONDITION AGGRAVATED BY OVEREXPOSURE:

A knowledge of the available toxicology information and of the physical and chemical properties of the material suggest that overexposure is unlikely to aggravate existing medical conditions.

Section VIII - Exposure Control Methods

During formulation of this product, use the following recommended industrial hygiene practices:

Wear an approved pesticide respirator.

Wear chemical splash goggles or face shield to prevent contact with the eyes.

Wear rubber gloves and apron to prevent contact with the skin. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

For end-users, refer to product label for personal protective clothing/equipment.

Section IX - Spill or Leak Procedures

Absorb with an inert material such as clay or sawdust. Place in an approved closed container for disposal.

Waste Disposal: Dispose in accord with local, state and federal regulations.

Section X - Special Precautions

Handling and Storage: Do not contaminate water, food or feed by storage or disposal. Store in a secure, dry, well-ventilated separated room, building or covered area.

Not for use or storage in or around the home.

Keep away from sources of ignition and protect from exposure to fire and heat.

Segregate from incompatible materials listed in the Reactivity Data Section.

Because of this material's flash point, areas containing this material should conform to the codes, such as NFPA 30 and NFPA 70, governing Class III for combustible liquids.

Section XI - Additional Regulatory Information

SARA Title III Data

Section 311 and 312 Hazard categories

Immediate Health Hazard - Y
Delayed Health Hazard - N
Fire Hazard - Y
Reactive Hazard - N
Sudden pressure Release Hazard - N

EPA Reg.No.: 432-550
Date: May 15, 1990

Section 302 Extremely Hazardous Substances - None

Section 313 Toxic Chemicals - None

CERCLA Reportable Quantity: None

This material is not listed as a carcinogen/potential carcinogen by IARC, OSHA or NTP.

Hazardous Materials Identification System (HMIS) Rating.

Health - 3
Flammability - 2
Reactivity - 1
Personal Protection - J

This information and statements herein are believed to be reliable but are not to be construed as a warranty or representation for which we assume legal responsibility. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information or products referred to herein. NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS MADE.

ID 32. 15
NUSYN-NOXFISH

NUSYN-NOXFISH™

FISH TOXICANT
SYNERGIZED ROTENONE
LIQUID - EMULSIFIABLE

ACTIVE INGREDIENTS:	
Rotenone	2.5% w/w
Other cube extractives	5.0%
Piperonyl Butoxide, Technical*	2.5%
INERT INGREDIENTS:	90.0%
	100.0% w/w

*Equivalent to 2.0% [Butylcarbityl] [6-propylpiperonyl] ether and 0.5% related compounds

™Penick-Bio UCLAF Corporation Trademark

KEEP OUT OF REACH OF CHILDREN

WARNING

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

SPECIMEN LABEL

EPA Est.: See Lot No. For Correlation

EPA Reg. No. 432-550 G 42545-MO-1 P-3/31/86
H 5905-AR-1

NET CONTENTS: GALLONS

PENICK-BIO UCLAF CORPORATION

P.O. Box 9059 1050 Wall Street West, Lyndhurst, New Jersey 07071 USA

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS & DOMESTIC ANIMALS
WARNING

May be fatal if swallowed. May cause eye injury. Causes skin irritation. Do not get in eyes, on skin, or on clothing. Wear protective goggles, faceshield, or safety glasses. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

ENVIRONMENTAL HAZARDS

Keep out of lakes, streams or ponds except under use conditions. Do not contaminate water by cleaning of equipment or disposal of wastes.

PHYSICAL HAZARDS

Combustible mixture. Flash point of this formulation is 115°F. DO NOT USE OR STORE NEAR HEAT OR OPEN FLAME.

STATEMENT OF PRACTICAL TREATMENT

If swallowed: Do not induce vomiting. Call a physician or Poison Control Center. Drink promptly a large quantity of milk, egg whites, gelatin solution, or if these are not available drink large quantities of water. Avoid alcohol. Get medical attention.
If in eyes: Flush with plenty of water. Get medical attention.
If on skin: Wash with plenty of soap and water. Get medical attention.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

STORAGE & DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.
PESTICIDE DISPOSAL: Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.
CONTAINER DISPOSAL: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and Local authorities.

DIRECTIONS FOR USE Continued on reverse side.

DIRECTIONS FOR USE (Continued)

GENERAL INFORMATION

Nusyn-Noxfish is a specially formulated product containing synergized rotenone, to be used in fisheries management for the eradication of fish from lakes, streams and reservoirs. Nusyn-Noxfish will not solidify nor show any separation at temperatures down to 40°F and is stable for a minimum of one year when stored in sealed drums at 70°F.

DIRECTIONS FOR USE

Apply this product only as specified on this label. Nusyn-Noxfish is registered for use by or under permit from and after consultation with State and Federal Fish and Wildlife Agencies.

FOR USE IN PONDS, LAKES AND RESERVOIRS

SPECIAL INSTRUCTIONS: Water alkalinity, temperature, and turbidity are usually different in each type water. Because these factors change the effectiveness of piscicides, consult your State Game & Fish representative before use to determine the correct concentration of this product needed for the type kill desired. Nusyn-Noxfish disperses readily in water both laterally and vertically, and will penetrate below the thermocline in thermally stratified bodies of water.

COMPUTATION OF ACRE-FEET: AN ACRE-FOOT is a unit of volume of a body of water having the area of one acre and a depth of one foot. To determine acre feet in a given body of water, make a series of transects across the water body taking depths with a measured pole or weighted line. Add the soundings and divide by the number made to determine the average depth. Multiply this average depth by the total surface to find the acre feet to be treated. If number of surface acres is unknown, contact your local Soil Conservation Service, which can determine this from aerial photographs.

AMOUNT OF NUSYN-NOXFISH NEEDED FOR SPECIFIC USES: To determine the approximate number of gallons of Nusyn-Noxfish (2.5% Rotenone) needed, find your "Type of Use" in the first column of the Table below and then divide the corresponding numbers in the third column, "Number of Acre-Feet Covered by One Gallon", into the number of acre-feet in your body of water.

TYPE OF USE	PARTS PER MILLION of 2.5% Rotenone	Number of Acre-Feet Covered by One Gallon
Selective Treatment	.20 to .25	15 to 12
Normal pond use	1.0 to 2.0	3.0 to 1.5
Remove bullheads or carp	2.0 to 4.0	1.5 to .75
Remove bullheads or carp in rich organic muds	4.0 to 8.0	.75 to .38
Preimpoundment treatment above dam	6.0 to 10.0	.50 to .30

PRE-MIXING AND METHOD OF APPLICATION: Pre-mix with water at a rate of one gallon Nusyn-Noxfish to 10 gal. of water. Uniformly apply over water surface or bubble through underwater lines.

DETOXIFICATION: Nusyn-Noxfish treated waters detoxify under natural conditions within 1 week to 1 month depending upon temperatures, alkalinity, etc. Rapid detoxification can be accomplished by adding chlorine or potassium permanganate to the water at the same rate as Nusyn-Noxfish in parts per million, plus enough additional to meet the chlorine demand of the untreated water.

REMOVAL OF TASTE AND ODOR: Nusyn-Noxfish treated waters do not retain a detectable taste or odor for more than a few days to a maximum of one month. Taste and odor can be removed immediately by treatment with activated charcoal at a rate of 30 ppm for each 1 ppm Nusyn-Noxfish remaining. (NOTE: As Nusyn-Noxfish detoxifies, less charcoal is required.)

RESTOCKING AFTER TREATMENT: Wait 2 to 4 weeks after treatment. Place a sample of fish to be stocked in wire cages in the coolest part of the treated waters. If the fish are not killed within 24 hours, the water may be restocked.

FOR USE IN STREAMS, IMMEDIATELY ABOVE PONDS, LAKES OR RESERVOIRS: Allow Nusyn-Noxfish to drain from drum directly into center of stream at a rate of .85-1.7cc per minute for each cubic foot of water flowing per second in the stream (0.5-1.0 part per million Nusyn-Noxfish or 0.0125-0.025 ppm rotenone).

IMPORTANT-READ BEFORE PURCHASE OR USE: WARRANTY STATEMENT

Our recommendations for the use of this product are based upon tests believed to be reliable. The use of this product being beyond the control of the manufacturer, no guarantee, expressed or implied, is made as to the effects of such or the results to be obtained if not used in accordance with directions or established safe practice. The buyer must assume all responsibility, including injury or damage, resulting from its misuse as such, or in combination with other materials.

Material Safety Data Sheet

1994 32.46

SePRO
850 North Meridian Street, Suite 200
Carmel, Indiana 46032
Phone: (317) 580-8282 Fax: (317) 580-8281

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 2

To	Jennifer Otte	From	Pam Gibson
Co.		Co.	
Dept.	MSDS/SRP	Phone #	317-580-8282
Fax #	610-774-7337	Fax #	317-580-8280

SONAR* SRP Herbicide

1. INGREDIENTS: (% w/w, unless otherwise noted)

1-Methyl-3-phenyl-5-(3-(trifluoromethyl)phenyl)-4(1H)-pyridinone (Fluridone)
CAS# 059756-60-4 ..... 5%
Other Ingredients 95%

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

2. PHYSICAL DATA:

BOILING POINT: Not applicable
VAP. PRESS: Not applicable
VAP. DENSITY: Not applicable
SOL. IN WATER: Insoluble, but disintegrates in water
SP. GRAVITY: Not applicable
APPEARANCE: Dark gray to dark brown pellet
ODOR: Faint musty odor
pH: (aqueous 50/50) 3.5

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: Not applicable
METHOD USED: Not applicable
FLAMMABLE LIMITS:
LFL: Not applicable
UFL: Not applicable
AUTO-IGNITION TEMPERATURE: No ignition up to 1382°F, 750°C
EXTINGUISHING MEDIA: Use water, CO_2 or dry chemicals.
FIRE AND EXPLOSION HAZARDS: Will emit toxic vapors as it burns.
FIRE-FIGHTING EQUIPMENT: Wear full protective clothing and use self-contained breathing apparatus.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) None known
INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) None known
HAZARDOUS DECOMPOSITION PRODUCTS: Will emit toxic vapors as it burns.
HAZARDOUS POLYMERIZATION: Does not occur.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ENVIRONMENTAL DATA: Follow use directions carefully so as to minimize adverse effects on nontarget organisms. IN ORDER TO AVOID IMPACT ON THREATENED OR ENDANGERED AQUATIC PLANT OR ANIMAL SPECIES, USERS MUST CONSULT THEIR STATE FISH AND GAME AGENCY OR THE U.S. FISH AND WILDLIFE SERVICE BEFORE MAKING APPLICATIONS. Do not contaminate water by cleaning of equipment or disposal of wastes. Trees and shrubs growing in water treated with SONAR may be injured. Do not apply in tidewater or brackish water. Do not apply in lakes, ponds, or other bodies of water where crayfish farming is performed.

ACTION TO TAKE FOR SPILLS: Contain and sweep up material of small spills and dispose as waste. Large spills report to CHEMTREC and DowElanco for assistance. Prevent runoff.

DISPOSAL METHOD: Do not contaminate water, food or feed by storage or disposal. Wastes resulting from the use of this product may be disposed of at an approved waste disposal facility in accordance with applicable regulations.

6. HEALTH HAZARD DATA:

ACUTE EXPOSURE (SONAR SRP)
Eyes - Rabbit, irritant
Skin - Rabbit, 2000 mg/kg, no deaths or toxicity, nonirritant
Inhalation - This formulation is not considered to be an inhalation hazard due to pelleted nature of material
Ingestion - Rat, 500 mg/kg, no deaths or toxicity
Sensitization - This formulation was not tested. Fluridone technical is not a contact sensitizer in guinea pigs.

CHRONIC EXPOSURE (Fluridone Technical) The following effects were reported in chronic, teratogenic, and reproductive toxicity studies in laboratory animals where experimental dosage levels and durations of exposure were far in excess of those likely to occur in humans.
Chronic Toxicity - Decreased survival in lifetime feeding study. Increased liver enzyme activity, liver weight, liver cell size, and microscopic liver cell changes.

*Trademark of DowElanco

Material Safety Data Sheet

32.46.

SePRO
11550 North Meridian Street, Suite 200
Carmel, Indiana 46032
Phone: (317) 580-8282 Fax: (317) 580-8290

Emergency Phone: 517-636-4400
General Phone: 1-800-352-6776

EPA Reg. Number: 62719-123
Effective Date: January 27, 1992
Product Code: 20159
MSDS Number: 004001
DowElanco • Indianapolis, IN 46268

SONAR* SRP Herbicide

Increased kidney weights, and microscopic kidney cell changes. Increased serum enzyme levels.
Teratology & Reproduction - Not teratogenic. Fetal deaths at maternally toxic doses. No effects on reproductive performance.
Mutagenicity - Not mutagenic in either bacterial or mammalian cells.
Carcinogenicity - Not listed as a carcinogen or potential carcinogen by IARC, NCI/NTP, OSHA, or ACGIH. Not considered to be carcinogenic in lifetime feeding studies.

SIGNS AND SYMPTOMS OF EXPOSURE: There are no reports of significant exposure to SONAR SRP. In two reports of children swimming in water treated with SONAR, no symptoms developed.

PRIMARY ROUTES OF ENTRY: Skin and inhalation.

7. FIRST AID:

EYES: Flush eyes with plenty of water and call a physician if irritation develops.

SKIN: Wash exposed areas with plenty of soap and water. Wash all contaminated clothing before reuse. Call a physician if irritation develops.

INGESTION: Do not induce vomiting. Call a physician or Poison Control Center. If available, administer activated charcoal (6-8 heaping teaspoonfuls) with a large quantity of water. Do not give anything by mouth to an unconscious person. Immediately transport to a medical care facility and see a physician.

INHALATION: If discomfort occurs, move individual to fresh air. If breathing difficulty occurs, get medical attention. If not breathing, provide cardiopulmonary resuscitation assistance and get medical attention immediately.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: No information available.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): PEL and TLV not established.

VENTILATION: Good general ventilation should be sufficient for most conditions.

RESPIRATORY PROTECTION: No respiratory protection should be needed when used in accordance with label instructions.

SKIN PROTECTION: No precautions other than normal work clothing should be needed.

EYE PROTECTION: Use safety glasses.

9. ADDITIONAL INFORMATION:

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep out of reach of children. Harmful if swallowed, absorbed through skin, or if inhaled. Avoid breathing of dust or contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling. Wash exposed clothing before reuse.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA 704)
(4=Extreme; 3=High; 2=Moderate; 1=Slight; 0=Insignificant)
Health: 2 Flammability: 1 Reactivity: 0

SHIPPING REQUIREMENTS DOT Hazard Class: Not regulated.

MSDS STATUS: Revised 1/92, Section 8

REGULATORY INFORMATION:

(Not meant to be all-inclusive—selected regulations represented).

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See MSD Sheet for health and safety information.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:
An immediate health hazard

The Information Herein Is Given In Good Faith.
But No Warranty, Express Or Implied, Is Made.
Consult The DowElanco Company For Further Information.

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

RODUCT : POWERLINE PPL04

EFFECTIVE DATE:04-02-93
PRINTED: 04-02-93

REVISIONS TO SECTIONS: ;EDIT:PROD.APP.

RODUCT APPLICATION:WATER-BASED CORROSION INHIBITOR.

----SECTION 1----------HAZARDOUS INGREDIENTS----------

NFORMATION ON PHYSICAL HAZARDS,HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC RODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS ISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE ND CHRONIC HAZARDS OF THIS FORMULATION.THIS PRODUCT IS SUBJECT TO THE ENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

BENZOTRIAZOLE,METHYL,SODIUM SALT***CAS# 64665-57-2; CORROSIVE TO EYES AND SKIN;TOXIC(ORAL INGESTION); PEL:NOT DETERMINED;TLV:NOT DETERMINED

ONHAZARD INGREDIENTS: WATER(CAS# 7732-18-5)

----SECTION 2----------TYPICAL PHYSICAL DATA----------

H: AS IS(APPROX.)	13.0	ODOR: MILD	
L.PT.(DEG.F):> 200	SETA(CC)	SP.GR.(70F):	1.192
APOR PRESSURE(mmHG):	ND	VAPOR DENSITY(AIR=1):	ND
ISC cps70F:	78	%SOLUBILITY(WATER):	100.0
VAP RATE: <	1.00(ETHER=1)	APPEARANCE: AMBER	
HYSICAL STATE:LIQUID		FREEZE POINT(DEG.F):	-25.00

----SECTION 3----------REACTIVITY DATA----------

TABLE.MAY REACT WITH ACIDS.DO NOT CONTAMINATE. BETZ TANK CLEAN-OUT ATEGORY 'C'

HERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

PRODUCT : POWERLINE PPL04

------SECTION 4---------HEALTH HAZARD EFFECTS----------

ITE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
CORROSIVE TO SKIN

ACUTE EYE EFFECTS ***
CORROSIVE TO THE EYES

ACUTE RESPIRATORY EFFECTS ***
MISTS/AEROSOLS CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

CHRONIC EFFECTS OF OVEREXPOSURE***
PROLONGED OR REPEATED CONTACT MAY CAUSE TISSUE NECROSIS.

MEDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

SYMPTOMS OF EXPOSURE ***
CAUSES REDNESS OR ITCHING OF SKIN,POSSIBLY LEADING TO BURNS,DEPENDENT ON LENGTH OF EXPOSURE:

PRECAUTIONARY STATEMENT BASED ON TESTING RESULTS ***
MAY BE TOXIC IF ORALLY INGESTED.

-----SECTION 5----------FIRST AID INSTRUCTIONS----------

SKIN CONTACT ***
REMOVE CLOTHING.WASH AREA WITH LARGE AMOUNTS OF SOAP SOLUTION OR WATER FOR 15 MIN.IMMEDIATELY CONTACT PHYSICIAN

EYE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA.APPLY NECESSARY FIRST AID TREATMENT.IMMEDIATELY CONTACT A PHYSICIAN.

INGESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DO NOT INDUCE VOMITING.IMMEDIATELY CONTACT PHYSICIAN. DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER

----SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS----------

SPILL INSTRUCTIONS***
VENTILATE,AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER.THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS****
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

RODUCT : POWERLINE PPL04
----SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------
OTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134.USE
SPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
ENTILATION PROTECTION***
ADEQUATE VENTILATION
ECOMMENDED RESPIRATORY PROTECTION***
IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH DUST/MIST FILTERS.
ECOMMENDED SKIN PROTECTION***
GAUNTLET-TYPE RUBBER GLOVES,CHEMICAL RESISTANT APRON
WASH OFF AFTER EACH USE REPLACE AS NECESSARY.
ECOMMENDED EYE PROTECTION***
SPLASH PROOF CHEMICAL GOGGLES.FACE SHIELD

----SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------
TORAGE INSTRUCTIONS***
KEEP CONTAINERS CLOSED WHEN NOT IN USE.
STORE IN COOL VENTILATED LOCATION.STORE AWAY FROM OXIDIZERS
ANDLING INSTRUCTIONS***
ALKALINE.CORROSIVE(SKIN/EYES).DO NOT MIX WITH ACIDIC MATERIAL.
****
HIS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD
****

APPENDIX: REGULATORY INFORMATION

HE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
FFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
NY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

T A: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY
REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
NOT APPLICABLE
..RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE
DENTIFICATION NUMBER IS:D002=CORROSIVE(SKIN,PH)
..DOT HAZARD/UN#/ER GUIDE# IS :CORROSIVE TO SKIN/UN1760/#60
..CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS:NONE
..SARA SECTION 302 CHEMICALS:NONE
..SARA SECTION 313 CHEMICALS:NONE
..SARA SECTION 312 HAZARD CLASS:IMMEDIATE(ACUTE);DELAYED(CHRONIC)
..MICHIGAN CRITICAL MATERIALS: NONE
NFPA/HMIS : HEALTH - 3; FIRE - 1; REACTIVITY - 0; SPECIAL - CORR; PE - D

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: POWERLINE PPL04 May 17, 1994

AQUATIC TOXICOLOGY

Daphnia magna 48 Hour Static Acute Bioassay

LC50: 311.2 mg/L
No Effect Level: 210

Bluegill Sunfish 96 Hour Static Acute Bioassay

LC50: 109.3 mg/L
No Effect Level: 42

BIODEGRADATION

COD (mg/gm): 790
TOC (mg/gm): 259

BOD-5 (mg/gm): 4
BOD-28 (mg/gm): 22

Closed Bottle Test
% Degradation in 28 days: 6

Zahn-Wellens Test
% Degradation in 28 days: 9

MAMMALIAN TOXICOLOGY

Oral LD50 RAT: >1,400 MG/KG
Note - ESTIMATED VALUE

Dermal LD50 RABBIT: >4,500 MG/KG
Note - ESTIMATED VALUE

MATERIAL SAFETY DATA SHEET COBRATEC® TT-50S

SECTION I

MANUFACTURER:	PMC SPECIALTIES GROUP
ADDRESS:	501 Murray Road Cincinnati, OH 45217
EMERGENCY TELEPHONE:	(513) 242-3300
FOR TRANSPORTATION EMERGENCY:	(800) 424-9300
CHEMICAL NAME AND SYNONYMS:	Sodium Tolyltriazole, 50% Water Solution
TRADE NAMES AND SYNONYMS:	COBRATEC® TT-50S
CHEMICAL FAMILY:	Triazole
FORMULA:	$C_7H_6N_3Na$
CAS REGISTRY NUMBER:	64665-57-2
DOT SHIPPING:	Caustic Alkali Liquid N.O.S. - UN1719
PRODUCT NUMBER:	X18WT7440

SECTION II HAZARDOUS INGREDIENTS

MATERIAL	%	TLV (Units)
Tolyltriazole, sodium salt	50	None Established.
Sodium Hydroxide, CAS No. 1310-73-2	<0.5	TWA=2mg/m³

SECTION III PHYSICAL DATA

BOILING POINT:	100° C
FREEZING POINT:	-8° C
SPECIFIC GRAVITY:	1.19 @ 25° C
VAPOR PRESSURE AT 20° C:	0.04 mm
VAPOR DENSITY:	Not Applicable
SOLUBILITY IN WATER:	Miscible in all proportions
% VOLATILES BY VOLUME:	50% as water
EVAPORATION RATE: (Butyl Acetate = 1)	Not Applicable
APPEARANCE AND ODOR:	Clear, yellow to amber solution, nearly odorless, pH=13.5

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: Not Applicable
AUTOIGNITION TEMPERATURE: Not Applicable
FLAMMABLE LIMITS IN AIR: LOWER: Not Applicable UPPER: Not Applicable
EXTINGUISHING MEDIA: Not Applicable
SPECIAL FIRE FIGHTING PROCEDURES: Full protective equipment including self-contained breathing apparatus should be used when COBRATEC® TT-50S is present during a fire. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Closed containers may rupture or explode due to steam pressure build-up when exposed to extreme heat. Water may be used to cool closed containers.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: None Established. For Sodium Hydroxide TWA=2mg/m^3

EFFECTS OF OVEREXPOSURE: Harmful if inhaled or swallowed. Corrosive. It is an irritant. Prolonged contact can be destructive to tissue. Contact with the eyes may severely damage delicate eye tissue. Exposure to large amounts is capable of producing serious injury.

EMERGENCY AND FIRST AID PROCEDURES: IF ON SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing, rings, etc. IF IN EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention. IF SWALLOWED: Never give anything by mouth to an unconscious person. DO NOT INDUCE VOMITING. Give large amounts of water, vinegar 1:4 or lemon juice. Follow with milk. Seek medical attention. IF INHALED: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

TOXICITY DATA: The acute toxicity data for TT-50S are as follows:

LD_{50} Oral (rat):	920 mg/kg (Male) 640 mg/kg (Female)
Eye and Skin Irritant:	Can cause severe irritation **

** Due to free caustic content.

SECTION VI REACTIVITY DATA

STABILITY: Stable
INCOMPATIBILITY: Oxidizing Agents, strong acids
HAZARDOUS DECOMPOSITION PRODUCTS: BY FIRE: Carbon Dioxide, Carbon Monoxide, Nitrogen oxides, HCN possible in reducing atmospheres.
HAZARDOUS POLYMERIZATION: Will Not occur

MSDS COBRATEC® TT-50S

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE THE MATERIAL IS SPILLED OR RELEASED: Pick up spill on suitable absorbent material. Flush spill area with water.

WASTE DISPOSAL METHOD: Sanitary landfill or incinerate in approved facilities in accordance with local, state, and federal regulations regarding pollution. Do not heat or incinerate in closed containers.

SECTION VIII SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION: If personal exposure cannot be controlled below applicable exposure limits by ventilation, wear respiratory devices approved by NIOSH/MSHA for protection against organic vapors, dust, fumes and mists.
VENTILATION: Local exhaust is recommended.
PROTECTIVE GLOVES: Necessary to avoid skin contact.
EYE PROTECTION: Use safety glasses with unperforated side shields, or full face shield when danger of splashing is great.
OTHER PROTECTIVE EQUIPMENT: Rubber apron or similar protective clothing to prevent contact with skin or clothes.

SECTION IX SPECIAL PRECAUTIONS

CORROSIVE MATERIAL Avoid contact with skin, eyes, and clothing. DO NOT TAKE INTERNALLY. Clean up spills immediately.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep containers tightly closed when not in use. Store only in containers which are resistant to caustic solutions.

REVISED : December 20, 1991
SUPERCEDES: December 19, 1990

ADDENDUM
Regulatory Review

NaOH (1310-73-2) is contained on the following chemical lists:

Clean Water Act Section 311
(40 CFR 116.4, 54 FR 33426)

Superfund - CERCLA Hazardous Substances
RQ - 1000 lb as NaOH

COBRATEC® TT-50-S

SODIUM TOLYLTRIAZOLE SOLUTION

CORROSION INHIBITOR

FOR COPPER AND COPPER ALLOYS

IMPROVES PERFORMANCE OF OTHER INHIBITORS FOR OTHER METAL

TECHNICAL BULLETIN 3210

GENERAL DESCRIPTION

COBRATEC® TT-50-S is a corrosion inhibitor for copper and copper-base alloys. It is very similar to COBRATEC® TT-100 in performance and mechanism of protection. It differs only in that it is an aqueous solution of the sodium salt of tolyltriazole. This permits faster make-up of treating solutions through simple dilution to the desired concentration.

COBRATEC® TT-50-S functions by reacting with copper oxide on the surface of copper or copper alloys forming a strong, insoluble polymeric complex. This complex formation results in a protective layer or film on the copper surface, a few molecules thick, that provides both a mechanical and electrochemical barrier against corrosive attack. This protective layer has a high degree of thermal and oxidative stability and cannot be easily removed. COBRATEC® TT-50-S complexes copper in solution, thereby preventing galvanic corrosion of other metals.

SUGGESTED USES

COBRATEC® TT-50-S can be used in most applications where COBRATEC® 99 and COBRATEC® TT-100 are effective. Due to a slightly higher color and odor, compared to COBRATEC® 99, it should be tested by the customer before use in any application where product acceptance may be effected. Otherwise functional substitution is possible. Some specific uses are:

Circulating Cooling Systems such as cooling towers, air conditioning systems, cutting and grinding fluids.

Functional Fluids such as hydraulic fluids, specialty lubricants and automotive coolants.

Corrosion Preventive Coatings such as water base lacquers and waxes.

Cleaners such as soaps, detergents and strong alkali or acid cleaners.

METHODS OF APPLICATION

COBRATEC® TT-50-S is incorporated in aqueous solutions at concentrations between 0.23% and 4.6%. Where COBRATEC® TT-50-S replaces COBRATEC® TT-100, the amount used should be increased by a factor of 2.3.

DESCRIPTION

Chemical Name	Tolyltriazole, sodium sa
Molecular Wt.	155.14
Formula	$C_7H_6N_3Na$
Code	CO-TT-50-S
Order Entry No.	X18WT7440
CAS Registry No.	64665-57-2

PROPERTIES

Appearance	Clear, red brown solutio
Solution Density, lb./gal (24°C)	9.85 - 9.95
Crystal Point, °C	-8.0
ph (10% solution)	12
Assay	50%

TOXICITY

The acute toxicity data for TT-50-S are as follows:

LD_{50} Oral (rats)	920 mg/Kg (Male) 640 mg/Kg (Female)
Eye and Skin Irritant	Can cause severe irritation**

**Due to free caustic content

The acute aquatic toxicity data for TT-50-S are:

96 Hr. LC_{50}:

Bluegill sunfish	191.2 mg/L
Rainbow trout	23.7 mg/L

Chronic Toxicity of TT-50-S to Daphnia Magna:

14 day	LC_{50}	13.2 mg/L
21 day	LC_{50}	5.8 mg/L

SAFE HANDLING

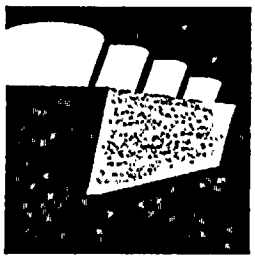
Corrosive solution. Store only in containers resistant to caustic solutions. Wear proper protective equipment for eye and skin protection. Avoid contact with skin, eyes and clothing. Adequate ventilation and other engineering controls should be used to reduce employee exposure where necessary.

AVAILABILITY

Readily available from stock in 5 gal. pails and 55 gal. drums. Bulk quantities are also available.

BETZ Industrial

product facts



BETZ® SLIMICIDE C-70

- **Eliminates the need to handle gaseous chlorine**
- **Effective against bacterial, fungal, and algal slimes**
- **Will not depress cooling water pH**

DESCRIPTION AND USE

BETZ Slimicide C-70 is a liquid source of chlorine which aids in the control of bacterial, fungal, and algal slimes in cooling tower water systems; influent systems, such as flow-through filters and lagoons, heat exchange water systems and industrial water scrubbing systems. It also controls slimes in brewery pasteurizers, industrial air washing systems equipped with mist eliminators, and once-through industrial cooling water systems.

TREATMENT AND FEED REQUIREMENTS

Dosage—Proper treatment levels for Slimicide C-70 depend on many factors, such as the severity of the problem, age of the product, and conditions particular to a given installation.

When the system is noticeably fouled, add 8 to 16 ounces of Slimicide C-70 per each 1000 gallons of water in the system to achieve 7.5 to 15.0 parts per million available chlorine by weight. Dosage should be repeated until control is achieved.

When microbiological control is evident apply 4 to 8 ounces of Slimicide C-70 per each 1000 gallons of water in the system to achieve 3.75 to 7.5 parts per million available chlorine by weight. Apply treatment weekly or as needed to maintain control.

Since this product degrades with age, dosages may need to be increased to obtain the required level of available chlorine. A chlorine test kit should be used to determine the increase in dosage rate.

Dilution and Feedpoint—BETZ Slimicide C-70 should be fed without dilution at a point in the cooling water system where turbulence, flow patterns, etc., will insure good mixing of the product with the cooling water.

Feed Equipment—BETZ Slimicide C-70 is compatible with fiberglass, ceramic, Teflon, polyethylene, polyvinylchloride (PVC), Viton, Kynar, Hastelloy, and rubber-lined steel feed and storage equipment. The use of mild and stainless steel is not recommended and should be avoided.

GENERAL PROPERTIES

Appearance	green liquid
Sodium Hypochlorite	12.5%
Inert Ingredients	87.5%
EPA Reg. No.	3876-142
Density (70 °F)	10.2 lb/gal
Flash Point (closed cup)	>200 °F
Freeze Point	−14.0 °F
Freeze/Thaw Stability (3 cycles)	stable
pH (Neat)	12.5
Pour Point (ASTM)	−9.0 °F
Specific Gravity (70 °F)	1.21
Viscosity (70 °F)	13.2 cP

SAFETY PRECAUTIONS

A Material Safety Data Sheet containing detailed information relative to this product is available upon request.

PACKAGING INFORMATION

BETZ Slimicide C-70 is blended as a liquid, and is supplied in bulk quantities only.

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

PRODUCT : SLIMICIDE C-70
EFFECTIVE DATE 04-19-91
PRINTED: 20-Apr-1991
REVISIONS TO SECTIONS: 1,APPENDIX/9

PRODUCT APPLICATION : WATER-BASED MICROBIAL CONTROL AGENT.

-----SECTION 1----------HAZARDOUS INGREDIENTS----------

INFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION. THIS PRODUCT IS SUBJECT TO THE PENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

SODIUM HYPOCHLORITE***CAS#7681-52-9;CORROSIVE;PEL:NONE;TLV:NONE.

SODIUM CHLORIDE***CAS#7647-14-5;EYE IRRITANT;PEL/TLV:NONE.

SODIUM HYDROXIDE(CAUSTIC SODA)***CAS#1310-73-2;CORROSIVE;TOXIC IF ORALLY INGESTED;PEL:2.0MG/M3;TLV:2.0MG/M3(CEILING).

NONHAZARD INGREDIENTS: WATER(7732-18-5)

----SECTION 2----------TYPICAL PHYSICAL DATA----------

PH: AS IS (APPROX.) 12.5	ODOR: CHLORINE
FL.PT.(DEG.F): >200 SETA(CC)	SP.GR.(70F)OR DENSITY: 1.217
VAPOR PRESSURE(mmHG): 22	VAPOR DENSITY(AIR=1): ND
VISC cps70F: 13.2	%SOLUBILITY(WATER): 100
EVAP.RATE: <1 ETHER=1	APPEARANCE: YELLOW TO GREEN
PHYSICAL STATE: LIQUID	FREEZE POINT(DEG.F): -14

-----SECTION 3----------REACTIVITY DATA----------

STABLE.MAY REACT WITH ACIDS.DO NOT CONTAMINATE. BETZ TANK CLEAN-OUT CATEGORY 'C'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

ODUCT: SLIMICIDE C-70

---SECTION 4----------HEALTH HAZARD EFFECTS----------

UTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
CORROSIVE TO SKIN
[redacted]YE EFFECTS ***
CORROSIVE TO THE EYES
UTE RESPIRATORY EFFECTS ***
VAPORS,GASES,MISTS AND/OR AEROSOLS CAUSE IRRITATION TO UPPER RESPIRATORY TRACT
RONIC EFFECTS OF OVEREXPOSURE***
PROLONGED OR REPEATED CONTACT MAY CAUSE TISSUE NECROSIS.
DICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

MPTOMS OF EXPOSURE ***
CAUSES SEVERE IRRITATION,BURNS OR TISSUE ULCERATION WITH SUBSEQUENT SCARRING.

---SECTION 5----------FIRST AID INSTRUCTIONS----------

IN CONTACT***
REMOVE CLOTHING.WASH AREA WITH LARGE AMOUNTS OF SOAP SOLUTION OR WATER FOR 15 MIN.IMMEDIATELY CONTACT PHYSICIAN
E CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT
HALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA.APPLY NECESSARY FIRST AID TREATMENT.IMMEDIATELY CONTACT A PHYSICIAN.
GES[redacted]ON***
[redacted]OT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
O NOT INDUCE VOMITING.IMMED.CONTACT PHYSICIAN.DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER

---SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS---------

ILL INSTRUCTIONS***
VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL, SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD SAND/GRIT.
SPOSAL INSTRUCTIONS***
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
PRODUCT OR RINSATES THAT CANNOT BE USED SHOULD BE DILUTED WITH WATER BEFORE DISPOSAL IN A SANITARY SEWER.
RE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

PRODUCT: SLIMICIDE C-70

--SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------

PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.

VENTILATION PROTECTION***

ADEQUATE VENTILATION

RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY, USE RESPIRATOR WITH ACID GASSES CARTRIDGES AND DUST/MIST PREFILTERS

RECOMMENDED SKIN PROTECTION***

GAUNTLET-TYPE RUBBER GLOVES,CHEMICAL RESISTANT APRON

WASH OFF AFTER EACH USE.REPLACE AS NECESSARY

RECOMMENDED EYE PROTECTION***

SPLASH PROOF CHEMICAL GOGGLES.FACE SHIELD

-----SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------

STORAGE INSTRUCTIONS***

KEEP DRUMS & PAILS CLOSED WHEN NOT IN USE.

STORE AWAY FROM OXIDIZABLE AND COMBUSTIBLE MATERIALS

HANDLING INSTRUCTIONS***

ALKALINE.CORROSIVE(SKIN/EYES).DO NOT MIX WITH ACIDIC MATERIAL.

****

THIS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD

****

APPENDIX: REGULATORY INFORMATION

CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE CTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE. ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

..TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE TSCA INVENTORY

..FIFRA(40CFR):EPA REG.NO. 3876-20001

..REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:

'9 GALLONS DUE TO SODIUM HYPOCHLORITE;

:,933 GALLONS DUE TO SODIUM HYDROXIDE

..RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE IDENTIFICATION NUMBER IS: D002=CORROSIVE(SKIN,PH)

..DOT HAZARD/UN#/ER GUIDE# IS: CORROSIVE TO SKIN UN1791/#60

..CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS: NONE

..SARA SECTION 302 CHEMICALS: NONE

..SARA SECTION 313 CHEMICALS: NONE

..SARA SECTION 312 HAZARD CLASS: IMMEDIATE(ACUTE) AND DELAYED(CHRONIC)

..MICHIGAN CRITICAL MATERIALS: SODIUM HYPOCHLORITE(7681-52-9) ;

NFPA/HMIS : HEALTH - 3 ; FIRE - 0 ; REACTIVITY - 0 ; SPECIAL - CORR ; PE - D

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: SLIMICIDE C-70 May 17, 1994

AQUATIC TOXICOLOGY

Rainbow Trout 96 Hour Static Acute Bioassay

LC50: 1.9 mg/L
No Effect Level: 1.38

Daphnia magna 48 Hour Static Acute Bioassay

LC50: 1.6 mg/L
No Effect Level: 0.51

Bluegill Sunfish 96 Hour Static Acute Bioassay

LC50: 5.3 mg/L
No Effect Level: 2.8

BIODEGRADATION

NO DATA AVAILABLE

MAMMALIAN TOXICOLOGY

Dermal LD50 RABBIT: 3,000 MG/KG

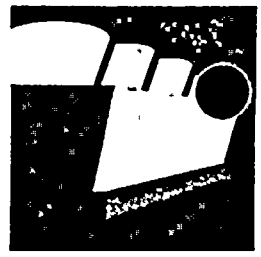
Skin Irritation Score RABBIT: 8

Eye Irritation Score RABBIT: 53

Oral LD50 RAT: 6,200 MG/KG

BETZ Industrial

product facts



BETZ® SLIMICIDE C-94
Microbiocide

- Economical source of bromine
- Registered for once-through cooling
- Liquid, easy to feed
- Use in $Cl_2(g)$ replacement programs

DESCRIPTION AND USE

BETZ Slimicide C-94 is a safe,easy to use source of bromine in liquid form. The bromine in this product is present as inactive bromide ion. It must be oxidized to Br+ in order to exert a toxic effect on microorganisms. Conversion of Br- to Br+ is usually achieved by co-feeding NaBr with chlorine [either $Cl_2(g)$ or NaOCl(1)]. In water, oxidation of Br- to Br+ results in the formation of hypobromous acid (HOBr) which is superior to hypochlorous acid (HOCl) for control of microorganisms in high pH, once-through, or ammonia contaminated waters.

TREATMENT AND FEEDING REQUIREMENTS

Activate bromide and generate hypobromous acid by co-feeding Slimicide C-94 with a source of chlorine. By controlling the ratio of chlorine to bromide ion, an all HOBr acid stream or a mix of HOBr and HOCl can be produced in the discharge stream.

Slimicide C-94 should be fed neat, and mixed with undiluted NaOCl or chlorinator discharge solution prior to application to tower basin or recirculating cooling water lines. Use an in-line static mixer to ensure adequate contact.

STORAGE AND FEED EQUIPMENT

Slimicide C-94 storage vessels should be corrosion resistant materials. Polyethylene, Fiberglass Reinforced Plastic or Stainless are recommended. Pumps should have corrosion resistant plastic heads. Feedlines and mixers should be of Schedule 80 PVC or Kynar (PVDF). The initial crystallization Temperature may warrant heat tracing and insulation in colder regions. Contact BES for information on pump feed or gravity feed packages.

GENERAL PROPERTIES

Appearance	Colorless, Odorless Liquid
Brookfield Viscosity at 70 °F(21 °C)	[illegible]P
Flash Point	>200 °F (P-m cc) (94 °C)
Freeze Point	<-30 °F (-34 °C)
Initial Crystallization Point	<0 °F (-18°C)
Percent Active	40% NaBr (By Weight)
pH	7.5 (Neat)
Specific Gravity	1.403 (70 °F)

PACKAGING INFORMATION

Slimicide C-94 is available in bulk and bulk bin (270 gal) F.O.B. El Dorado, Arkansas. Slimicide C-94 is available in 55 gal (208 L) drums out of Garland. The approximate net weight is 650 lb.(295 kg).

SAFETY PRECAUTIONS

Material Safety Data Sheets containing detailed information relative to this product are available upon request.

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

RODUCT : SLIMICIDE C-94
EFFECTIVE DATE 02-16-91
PRINTED: 26-Mar-1991

RODUCT APPLICATION : WATER-BASED MICROBIAL CONTROL AGENT.
----SECTION 1----------HAZARDOUS INGREDIENTS----------

NFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC
RODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS
ISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE
ND CHRONIC HAZARDS OF THIS FORMULATION. THIS PRODUCT IS SUBJECT TO THE
ENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

SODIUM BROMIDE***CAS#7647-15-6;IRRITANT;PEL/TLV:NONE.

NHAZARD INGREDIENTS: WATER(7732-18-5)

---SECTION 2----------TYPICAL PHYSICAL DATA----------
: AS IS (APPROX.) 7.5 ODOR: SLIGHT
.PT.(DEG.F): >200 P-M(CC) SP.GR.(70F)OR DENSITY: 1.403
POR PRESSURE(mmHG): 18 VAPOR DENSITY(AIR=1): <1
SC cps70F: 12 %SOLUBILITY(WATER): 100
AP.RATE: <1 ETHER=1 APPEARANCE: COLORLESS
YSICAL STATE: LIQUID FREEZE POINT(DEG.F): <-30
---SECTION 3----------REACTIVITY DATA----------

ABLE. BETZ TANK CLEAN-OUT CATEGORY 'B'

ERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

PRODUCT: SLIMICIDE C-94

-----SECTION 4----------HEALTH HAZARD EFFECTS----------

ACUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
NON-HAZARDOUS TO SKIN
E EYE EFFECTS ***
MODERATELY IRRITATING TO THE EYES

ACUTE RESPIRATORY EFFECTS ***
MISTS/AEROSOLS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

CHRONIC EFFECTS OF OVEREXPOSURE***
NO EVIDENCE OF POTENTIAL CHRONIC EFFECTS.

MEDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

SYMPTOMS OF EXPOSURE ***
MAY CAUSE REDNESS OR ITCHING OF SKIN.

-----SECTION 5----------FIRST AID INSTRUCTIONS----------

SKIN CONTACT***
REMOVE CONTAMINATED CLOTHING.WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR.APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY

INGESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DILUTE CONTENTS OF STOMACH.INDUCE VOMITING BY ONE OF THE STANDARD METHODS.IMMEDIATELY CONTACT A PHYSICIAN

-----SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS---------

SPILL INSTRUCTIONS***
VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER.THE CONTAMINATED ABSORBENT SHOULD BE CONSIDERED A PESTICIDE AND DISPOSED OF IN AN APPROVED PESTICIDE LANDFILL.SEE PRODUCT LABEL STORAGE AND DISPOSAL INSTRUCTIONS.
CONTAMINATED AREA MAY BE WASHED DOWN WITH WATER.

DISPOSAL INSTRUCTIONS***
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
DISPOSE OF IN APPROVED PESTICIDE FACILITY OR ACCORDING TO LABEL INSTRUCTIONS

FIRE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA: DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

ODUCT: SLIMICIDE C-94

CTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------

PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE SPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
NTILATION PROTECTION***
ADEQUATE VENTILATION
COMMENDED RESPIRATORY PROTECTION***
IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY, USE A RESPIRATOR WITH DUST/MIST FILTERS.
COMMENDED SKIN PROTECTION***
RUBBER GLOVES
WASH OFF AFTER EACH USE.REPLACE AS NECESSARY
COMMENDED EYE PROTECTION***
SPLASH PROOF CHEMICAL GOGGLES

---SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------

ORAGE INSTRUCTIONS***
KEEP DRUMS & PAILS CLOSED WHEN NOT IN USE.
DO NOT FREEZE.IF FROZEN,THAW AND MIX COMPLETELY PRIOR TO USE
NDLING INSTRUCTIONS***
NORMAL CHEMICAL HANDLING

****

IS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD

****

APPENDIX: REGULATORY INFORMATION

CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE CTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE. Y CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

TSCA: THIS IS AN EPA REGISTERED BIOCIDE AND IS EXEMPT FROM TSCA INVENTORY QUIREMENTS
FIFRA(40CFR):EPA REG.NO. 5785-81-3876
REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
APPLICABLE
RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE ENTIFICATION NUMBER IS: NOT APPLICABLE
DOT HAZARD/UN#/ER GUIDE# IS: NOT APPLICABLE
CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS: NONE
SARA SECTION 302 CHEMICALS: NONE
SARA SECTION 313 CHEMICALS: NONE
SARA SECTION 312 HAZARD CLASS: IMMEDIATE(ACUTE)
MICHIGAN CRITICAL MATERIALS: NONE
PA/HMIS : HEALTH - 1 ; FIRE - 0 ; REACTIVITY - 0 ; SPECIAL - NONE ; PE - A

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: SLIMICIDE C-94 May 17, 1994

AQUATIC TOXICOLOGY

Daphnia magna 48 Hour Static Acute Bioassay
Toxicity of hypobromous acid expressed as bromine.

LC50: 0.71 mg/L
No Effect Level: 0.41

Bluegill Sunfish 96 Hour Static Acute Bioassay
Toxicity of hypobromous acid expressed as bromine.

LC50: 0.52 mg/L
No Effect Level: 0.3

Rainbow Trout 96 Hour Static Acute Bioassay
Toxicity of hypobromous acid expressed as bromine.

LC50: 0.23 mg/L

Sheepshead Minnow 96 Hour Flow-Thru Bioassay
Toxicity of hypobromous acid expressed as bromine.

LC50: 0.19 mg/L
No Effect Level: 0.11

Mysid Shrimp 96 Hour Flow-Thru Bioassay
Toxicity of hypobromous acid expressed as bromine.

LC50: 0.17 mg/L

Daphnia magna 48 Hour Static Acute Bioassay
Toxicity of product as is.
LC50: 27500 mg/L

BIODEGRADATION

NO DATA AVAILABLE

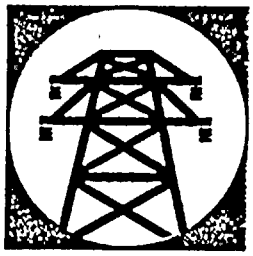
MAMMALIAN TOXICOLOGY

Oral LD50 RAT: >5,000 MG/KG

Dermal LD50 RABBIT: >2,000 MG/KG

Betz Industrial
The Water Management Division of Betz Laboratories, Inc.

product facts



BETZ® POWERLINE™ 3200
Closed System Corrosion Inhibitor/Deposit Control Agent

- **A non-chromate treatment not environmentally restricted**
- **Effective on steel, copper, solder, aluminum, and mixed metallurgy systems**
- **Stable and effective at high temperatures and high heat fluxes**
- **Compatible with antifreeze**

DESCRIPTION AND USE

POWERLINE 3200 is a non-chromate, inorganic-based corrosion inhibitor formulated specifically for closed cooling systems in the Power Industry. It is a highly effective corrosion inhibitor for steel, copper, solder, aluminum, and mixed metallurgy systems over a pH range of 6.0-9.5. POWERLINE 3200 also contains a broad spectrum dispersant to control deposition and scaling. In addition to its superior corrosion protection and dispersant properties, POWERLINE 3200 has exceptional chemical and thermal stability. Unlike nitrites, it is not oxidized by aeration, soluble iron, or biological activity. POWERLINE 3200 has proven stable and effective in chilled water systems as well as pressurized hot water systems operating at over 300F. Unlike chromate based inhibitors, POWERLINE 3200 is compatible with glycol and alcohol antifreeze solutions. POWERLINE 3200 contains no silicates or phosphates which can induce fouling in the presence of hardness.

POWERLINE 3200 is an environmentally acceptable alternative to chromates in the majority of applications. With its superior effectiveness on mixed metallurgies, dispersant properties, broad application range and inherent stability, POWERLINE 3200 offers significant performance advantages over nitrite-based programs.

TREATMENT AND FEEDING REQUIREMENTS

The normal treatment level for POWERLINE 3200 ranges from 1000 to 3500 ppm. However, the amount required will depend on many factors such as operating characteristics of the system and severity of the problem. Therefore, this product should be used in accordance with control parameters BETZ establishes for a specific application.

POWERLINE 3200 should be fed neat, at the level and frequency necessary to maintain the recommended concentration, using a suitable shot-feeding device. Tanks, pumps, piping and valves may be constructed of steel or most common plastics.

The level of POWERLINE 3200 should be monitored with a colorimetric procedure available from BETZ using either a visual comparator or a spectrophotometer.

GENERAL PROPERTIES

Appearance	clear, yellow liquid
Density (70F)	9.9 lbs/gal
Flash Point (closed cup)	>200F
Freeze Point	14F
Pour Point	19F
Brookfield Viscosity (70F)	4 cps
pH (undiluted)	12.8
(5% solution)	11.6

If product is frozen during shipment or storage, mix until homogeneous prior to use.

SAFETY PRECAUTIONS

A Material Safety Data Sheet containing detailed information relative to this product is available upon request.

PACKAGING INFORMATION

POWERLINE 3200 is blended as a liquid, and is supplied in 55-gallon bung-type nonreturnable steel drums. Approximate net weight—530 pounds per drum. In addition, POWERLINE 3200 is available under the BETZ Point Of Feed® Service Program for contracted quantities in certain geographic areas.

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

PRODUCT : POWERLINE 3200

EFFECTIVE DATE:09-22-9
PRINTED: 09-22-93

PRODUCT APPLICATION:WATER-BASED CORROSION INHIBITOR.

-----SECTION 1----------HAZARDOUS INGREDIENTS----------

INFORMATION ON PHYSICAL HAZARDS,HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD I LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUT AND CHRONIC HAZARDS OF THIS FORMULATION.THIS PRODUCT IS SUBJECT TO THE PENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

SODIUM MOLYBDATE(MOLYBDIC ACID,DISODIUM SALT)***CAS# 7631-95-0; POSSIBLE RESPIRATORY IRRITANT; PEL:5MG/M3(AS MO);TLV:5MG/M3(AS MO)

SODIUM NITRITE***CAS# 7632-00-0;OXIDIZER;TOXIC(ORAL INGESTION);POTENTIAL BLOOD TOXIN;PEL:NOT DETERMINED;TLV:NOT DETERMINED

NONHAZARD INGREDIENTS: WATER(CAS# 7732-18-5)

-----SECTION 2----------TYPICAL PHYSICAL DATA----------

PH: AS IS(APPROX.) 12.8	ODOR: MILD
FL.PT.(DEG.F):> 200 SETA(CC)	SP.GR.(70F): 1.184
VAPOR PRESSURE(mmHG): ND	VAPOR DENSITY(AIR=1): ND
VISC cps70F: 4	%SOLUBILITY(WATER): 100.0
EVAP RATE: < 1.00(ETHER=1)	APPEARANCE: YELLOW
PHYSICAL STATE:LIQUID	FREEZE POINT(DEG.F): 14.00

-----SECTION 3----------REACTIVITY DATA----------

STABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK CLEAN-OUT CATEGORY 'B'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

PRODUCT : POWERLINE 3200

----SECTION 4---------HEALTH HAZARD EFFECTS----------

SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
MAY CAUSE SLIGHT IRRITATION TO THE SKIN

ACUTE EYE EFFECTS ***
SEVERE IRRITANT TO THE EYES

ACUTE RESPIRATORY EFFECTS ***
MISTS/AEROSOLS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

CHRONIC EFFECTS OF OVEREXPOSURE***
PROLONGED OR REPEATED EXPOSURES MAY CAUSE BLOOD CELL DAMAGE OR IMPAIR BLOOD CELL FUNCTION.

MEDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

SYMPTOMS OF EXPOSURE ***
MAY CAUSE REDNESS OR ITCHING OF SKIN.

PRECAUTIONARY STATEMENT BASED ON TESTING RESULTS ***
MAY BE TOXIC IF ORALLY INGESTED.

----SECTION 5----------FIRST AID INSTRUCTIONS----------

SKIN CONTACT ***
REMOVE CONTAMINATED CLOTHING.WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR.APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY

INGESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DO NOT INDUCE VOMITING.IMMEDIATELY CONTACT PHYSICIAN. DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER

---SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS----------

SPILL INSTRUCTIONS***
VENTILATE,AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER.THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS****
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
FLOOD WITH WATER.USE OF CO2 OR FOAM MAY NOT BE EFFECTIVE.

PRODUCT : POWERLINE 3200

---SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------

PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134.USE RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.

VENTILATION PROTECTION***

ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS

RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY, USE A RESPIRATOR WITH DUST/MIST FILTERS.

RECOMMENDED SKIN PROTECTION***

RUBBER GLOVES

WASH OFF AFTER EACH USE REPLACE AS NECESSARY.

RECOMMENDED EYE PROTECTION***

SPLASH PROOF CHEMICAL GOGGLES

-----SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------

STORAGE INSTRUCTIONS***

KEEP CONTAINERS CLOSED WHEN NOT IN USE.

DO NOT FREEZE.IF FROZEN,THAW AND MIX COMPLETELY PRIOR TO USE

HANDLING INSTRUCTIONS***

CONTAINS AN OXIDIZER. AVOID ALL CONTACT WITH REDUCING AGENTS, OILS, GREASES, ORGANICS AND ACIDS. DO NOT ALLOW TO DRY.

****

THIS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD

****

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE. ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

...TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY

...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
101 GALLONS DUE TO SODIUM NITRITE;

...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE IDENTIFICATION NUMBER IS:D002=CORROSIVE(PH)

...DOT HAZARD/UN#/ER GUIDE# IS :ORM-B(WHEN CONTAINER > RQ)/NA1760/#60

...CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS:NONE

...SARA SECTION 302 CHEMICALS:NONE

...SARA SECTION 313 CHEMICALS:NONE

...SARA SECTION 312 HAZARD CLASS:IMMEDIATE(ACUTE);DELAYED(CHRONIC)

...MICHIGAN CRITICAL MATERIALS: NONE

NFPA/HMIS : HEALTH - 2; FIRE-- 1; REACTIVITY - 0; SPECIAL - ALK ; PE - B

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: POWERLINE 3200 May 17, 1994

AQUATIC TOXICOLOGY

Rainbow Trout 48 Hour Static Screen

0% Mortality: 2000 mg/L

Daphnia magna 48 Hour Static Acute Bioassay

LC50: 5997 mg/L
No Effect Level: 500

Bluegill Sunfish 96 Hour Static Acute Bioassay

LC50: 3258 mg/L
No Effect Level: 1800

BIODEGRADATION

NO DATA AVAILABLE

MMALIAN TOXICOLOGY

Oral LD50 RAT: 825 MG/KG
Note - ESTIMATED VALUE

Dermal LD50 RABBIT: >2,000 MG/KG
Note - ESTIMATED VALUE

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

PRODUCT : POWERLINE PPL10

EFFECTIVE DATE:06-22-9
PRINTED: 06-22-93

PRODUCT APPLICATION:WATER-BASED CORROSION INHIBITOR.

-----SECTION 1----------HAZARDOUS INGREDIENTS----------

INFORMATION ON PHYSICAL HAZARDS,HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION.THIS PRODUCT IS SUBJECT TO THE PENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

SODIUM NITRITE***CAS# 7632-00-0;OXIDIZER;TOXIC(ORAL INGESTION);POTENTIAL BLOOD TOXIN;PEL:NOT DETERMINED;TLV:NOT DETERMINED

NONHAZARD INGREDIENTS: WATER(CAS# 7732-18-5)

-----SECTION 2----------TYPICAL PHYSICAL DATA----------

PH: AS IS(APPROX.) 9.0	ODOR: MILD
FL.PT.(DEG.F):> 200 P-M(CC)	SP.GR.(70F): 1.107
VAPOR PRESSURE(mmHG): ~ 18.0	VAPOR DENSITY(AIR=1): < 1.00
VISC cps70F: 8	%SOLUBILITY(WATER): 100.0
EVAP RATE: < 1.00(ETHER=1)	APPEARANCE: LIGHT YELLOW
PHYSICAL STATE:LIQUID	FREEZE POINT(DEG.F): 19.00

-----SECTION 3----------REACTIVITY DATA----------

STABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK CLEAN-OUT CATEGORY 'B'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

RODUCT : POWERLINE PPL10

-----SECTION 4---------HEALTH HAZARD EFFECTS----------

SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
MAY CAUSE MODERATE IRRITATION TO THE SKIN

CUTE EYE EFFECTS ***
SEVERE IRRITANT TO THE EYES

CUTE RESPIRATORY EFFECTS ***
MISTS/AEROSOLS CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

HRONIC EFFECTS OF OVEREXPOSURE***
PROLONGED OR REPEATED EXPOSURES MAY CAUSE BLOOD CELL DAMAGE OR IMPAIR BLOOD CELL FUNCTION; MAY CAUSE CNS DEPRESSION.

EDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

YMPTOMS OF EXPOSURE ***
CAUSES IRRITATION OF THE SKIN,EYES,AND/OR RESPIRATORY SYSTEM.

RECAUTIONARY STATEMENT BASED ON TESTING RESULTS ***
MAY BE TOXIC IF ORALLY INGESTED.

----SECTION 5----------FIRST AID INSTRUCTIONS----------

KIN CONTACT ***
REMOVE CONTAMINATED CLOTHING.WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES

YE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

NHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR.APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY

NGESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DILUTE CONTENTS OF STOMACH.INDUCE VOMITING BY ONE OF THE STANDARD METHODS.IMMEDIATELY CONTACT A PHYSICIAN

--SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS----------

PILL INSTRUCTIONS***
VENTILATE,AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER.THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD SAND/GRIT.

SPOSAL INSTRUCTIONS****
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
INCINERATE OR BURY IN APPROVED LANDFILL

RE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
FLOOD WITH WATER.USE OF CO2 OR FOAM MAY NOT BE EFFECTIVE.

PRODUCT : POWERLINE PPL10

-----SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------

E PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134.
SPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.

VENTILATION PROTECTION***

ADEQUATE VENTILATION

RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY, USE A RESPIRATOR WITH DUST/MIST FILTERS.

RECOMMENDED SKIN PROTECTION***

RUBBER GLOVES

WASH OFF AFTER EACH USE REPLACE AS NECESSARY.

RECOMMENDED EYE PROTECTION***

SPLASH PROOF CHEMICAL GOGGLES

-----SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------

STORAGE INSTRUCTIONS***

KEEP CONTAINERS CLOSED WHEN NOT IN USE.

DO NOT FREEZE.IF FROZEN,THAW AND MIX COMPLETELY PRIOR TO USE

HANDLING INSTRUCTIONS***

CONTAINS AN OXIDIZER. AVOID ALL CONTACT WITH REDUCING AGENTS, OILS, GREASES, ORGANICS AND ACIDS. DO NOT ALLOW TO DRY.

****

THIS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD

****

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE. ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

.TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY

...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
72 GALLONS DUE TO SODIUM NITRITE;

...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE IDENTIFICATION NUMBER IS:NOT APPLICABLE

...DOT HAZARD/UN#/ER GUIDE# IS :ORM-E(WHEN CONTAINER > RQ)/NA9188/#31

...CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS:NONE

...SARA SECTION 302 CHEMICALS:NONE

...SARA SECTION 313 CHEMICALS:NONE

...SARA SECTION 312 HAZARD CLASS:IMMEDIATE(ACUTE);DELAYED(CHRONIC)

...MICHIGAN CRITICAL MATERIALS: NONE

NFPA/HMIS : HEALTH - 2; FIRE - 1; REACTIVITY - 0; SPECIAL - NONE; PE - B

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: POWERLINE PPL10 May 17, 1994

AQUATIC TOXICOLOGY

NO DATA AVAILABLE

BIODEGRADATION

NO DATA AVAILABLE

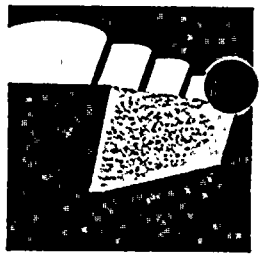
MAMMALIAN TOXICOLOGY

Oral LD50 RAT: 570 MG/KG
Note - ESTIMATED VALUE

Dermal LD50 RABBIT: >5,000 MG/KG
Note - ESTIMATED VALUE

BETZ Industrial

product facts



BETZ® 860
DEPOSIT REMOVAL PRODUCT

- Excellent for removal of calcium carbonate scale from cooling water systems.
- Also effective on calcium phosphate deposits.
- Can clean cooling systems of these deposits on-line eliminating production downtime.

DESCRIPTION AND USE

Betz 860 is a unique trade secreted material designed to remove calcium carbonate and/or calcium phosphate deposits from industrial and power cooling water systems. These deposits, which contribute to lost heat transfer or reduced water velocity, can be removed safely and easily, thus aiding in restoring a cooling system to its normal operating conditions.

Betz 860 is designed as a one-time supplement to normal cooling water system treatment. It is not applicable as a continuous cooling system treatment product.

TREATMENT AND FEEDING REQUIREMENTS

This product is designed to be used in two distinct manners:

1. Recirculating through a cooling water system.
2. Fill and soak for large industrial and power equipment.

The product is not designed for small industrial heat exchangers due to packaging restrictions.

Dosage - Proper treatment levels of Betz 860 depend on the thickness of the calcium carbonate and/or calcium phosphate deposit and the size of the system. Feed of the product is not based on system or equipment water volume. Betz will provide control parameters and monitoring guidelines for specific applications.

Feed Point - Betz 860 should be fed to the cooling tower basin if being utilized in a recirculating cooling system or to the makeup or recirculation pumps if cleaning large individual pieces of equipment (i.e.; power plant condenser).

System Parameters - Betz 860 can be fed to all cooling water systems except those containing galvanized material.

GENERAL PROPERTIES

Appearance	yellow to dark brown liquid
Density 70 °F(21 °C)	9.14 pounds per gallon
Flash Point (closed cup)	>200 °F(93 °C)
Freeze Point	26 °F(-3 °C)
Initial Crystallization	80 °F(27 °C)
pH (undiluted)	1.4
(5% solution)	2.3
Pour Point (ASTM)	31 °F(-1 °C)
Specific Gravity 70 °F(21 °C)	1.098
Viscosity 100 °F(38 °C)	9.0 CPS

PACKAGING INFORMATION

Betz 860 is a liquid material available only in bulk shipment quantities.

SAFETY PRECAUTIONS

Material Safety Data Sheets containing detailed information relative to this product are available upon request.

PRINTED IN USA

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

RODUCT : DEPOSI-TROL 860D

EFFECTIVE DATE:02-02-94
PRINTED: 02-02-94

RODUCT APPLICATION:CHEMICAL CLEANING COMPOUND.

---SECTION 1----------HAZARDOUS INGREDIENTS----------

NFORMATION ON PHYSICAL HAZARDS,HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC RODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS ISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE ND CHRONIC HAZARDS OF THIS FORMULATION.THIS PRODUCT IS SUBJECT TO THE ENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

TRADE SECRET INGREDIENT(E195); EYE IRRITANT; PEL:NOT DETERMINED;TLV:NOT DETERMINED;TSRN 125438 - 5118P

TRADE SECRET INGREDIENT(122); POSSIBLE EYE IRRITANT;PEL/TLV:NUISANCE DUST; PEL:NUISANCE DUST;TLV:NUISANCE DUST;NOTE:MANUFACTURER'S RECOMMENDED EXPOSURE LIMIT:10MG/M3.;TSRN 125438 - 5214P
TRADE SECRET INGREDIENT(222);OXIDIZER;CORROSIVE;PULMONARY DAMAGE;DENTAL EROSION;PEL:5MG/M3(10MG/M3-STEL);TLV:5MG/M3(10MG/M3-STEL);TSRN 125438 - 5238P

NHAZARD INGREDIENTS: WATER(CAS# 7732-18-5);TRADE SECRET (NK55) TSRN: 25438 - 5628P

---SECTION 2----------TYPICAL PHYSICAL DATA----------

: AS IS(APPROX.) 1.4	ODOR: ACID
.PT.(DEG.F):> 200 P-M(CC)	SP.GR.(70F): 1.098
POR PRESSURE(mmHG): ~ 18.0	VAPOR DENSITY(AIR=1): < 1.00
SC cps70F: ND	%SOLUBILITY(WATER): 100.0
AP RATE: < 1.00(ETHER=1)	APPEARANCE: YELLOW TO DARK BROWN
YSICAL STATE:LIQUID	FREEZE POINT(DEG.F): 26.00

---SECTION 3----------REACTIVITY DATA----------

ABLE.MAY REACT WITH ORGANICS OR ALKALINE MATERIALS.DO NOT NTAMINATE.BETZ TANK CLEAN-OUT CATEGORY 'D'

ERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

PRODUCT : DEPOSI-TROL 860D

----SECTION 4---------HEALTH HAZARD EFFECTS----------

ACUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
MAY CAUSE SLIGHT IRRITATION TO THE SKIN

ACUTE EYE EFFECTS ***
SEVERE IRRITANT TO THE EYES

ACUTE RESPIRATORY EFFECTS *** PRIMARY ROUTE OF EXPOSURE
VAPORS,GASES,MISTS AND/OR AEROSOLS CAUSE IRRITATION TO UPPER RESPIRATORY TRACT.

CHRONIC EFFECTS OF OVEREXPOSURE***
PROLONGED OR REPEATED EXPOSURE MAY CAUSE LUNG DAMAGE AND/OR MAY CAUSE PRIMARY IRRITANT DERMATITIS.

MEDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

SYMPTOMS OF EXPOSURE ***
INHALATION MAY CAUSE IRRITATION OF RESPIRATORY TRACT;SKIN CONTACT MAY CAUSE ITCHING AND/OR REDNESS.

PRECAUTIONARY STATEMENT BASED ON TESTING RESULTS ***
MAY BE TOXIC IF ORALLY INGESTED OR INHALED.

-----SECTION 5----------FIRST AID INSTRUCTIONS----------

SKIN CONTACT ***
REMOVE CONTAMINATED CLOTHING.WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR.APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY

INGESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DO NOT INDUCE VOMITING.IMMEDIATELY CONTACT PHYSICIAN. DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER

----SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS----------

SPILL INSTRUCTIONS***
VENTILATE,AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER.THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS****
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

RODUCT : DEPOSI-TROL 860D

--ECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------

.OTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134.USE
ESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
NTILATION PROTECTION***
ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS
ECOMMENDED RESPIRATORY PROTECTION***
IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH DUST/MIST FILTERS.
ECOMMENDED SKIN PROTECTION***
RUBBER GLOVES
WASH OFF AFTER EACH USE REPLACE AS NECESSARY.
ECOMMENDED EYE PROTECTION***
SPLASH PROOF CHEMICAL GOGGLES

---SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------

TORAGE INSTRUCTIONS***
KEEP CONTAINERS CLOSED WHEN NOT IN USE.
USE APPROVED CONTAINERS ONLY.STORE IN COOL,WELL-VENTED AREA.CONTACT WITH
METALS MAY RELEASE FLAMMABLE HYDROGEN GAS.
ANDLING INSTRUCTIONS***
CONTAINS AN OXIDIZER. AVOID ALL CONTACT WITH REDUCING AGENTS, OILS,
GREASES, ORGANICS AND ACIDS.

****

HIS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD

****

APPENDIX: REGULATORY INFORMATION

E CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
FFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
TY ANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

.TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY
.REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
9,111 GALLONS DUE TO (122);5,466 GALLONS DUE TO (222);
.RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE
DENTIFICATION NUMBER IS:D002=CORROSIVE(PH,STEEL)
.DOT HAZARD/UN#/ER GUIDE# IS :CORROSIVE TO STEEL/UN1760/#
.CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS:
REGULATED CONSTITUENT PRESENT AT OSHA THRESHOLDS
.SARA SECTION 302 CHEMICALS:; TRADE SECRET(222)--INORGANIC ACID
.SARA SECTION 313 CHEMICALS:; TRADE SECRET(222)--INORGANIC ACID , 2.0-
.0%
.SARA SECTION 312 HAZARD CLASS:IMMEDIATE(ACUTE);DELAYED(CHRONIC)
.MICHIGAN CRITICAL MATERIALS:
REGULATED CONSTITUENT PRESENT AT OSHA THRESHOLDS
FPA/HMIS : HEALTH - 2; FIRE - 1; REACTIVITY - 0; SPECIAL - CORR; PE - B

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: DEPOSI-TROL 860D May 18, 1994

AQUATIC TOXICOLOGY

Daphnia magna

48 Hour Screen
0% Mortality: 1000 MG/L

Fathead minnow

96 Hour Screen
0% Mortality: 1500 MG/L

BIODEGRADATION

NO DATA AVAILABLE

MAMMALIAN TOXICOLOGY

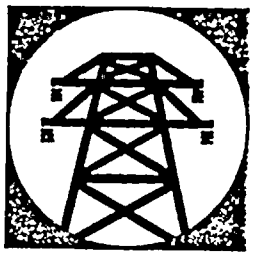
Oral LD50 RAT: >2,000 MG/KG
Note - ESTIMATED VALUE

Dermal LD50 RABBIT: >2,000 MG/KG
Note - ESTIMATED VALUE

Inhalation LC50 RAT: >2,000 PPM/HR
Note - ESTIMATED VALUE

Betz Industrial
The Water Management Division of Betz Laboratories, Inc

product facts



BETZ® POWERLINE™ 3680 DECHLORINATING AGENT

- **Eliminates both free and total chlorine residuals**
- **Enables compliance with new EPA regulations on chlorine discharge from utility cooling systems**
- **Allows use of sufficient chlorine to control difficult biological fouling problems**
- **Liquid product is safe and easy to handle**

DESCRIPTION AND USE

POWERLINE 3680 is an aqueous solution designed to react with and destroy both free and total chlorine residuals in once-through and open recirculating cooling systems in the Power Industry. The product is intended for use in systems where adequate control of microorganism and macroorganism fouling cannot be achieved at the low chlorine levels allowed by the recent EPA regulations.

Dechlorination of the cooling water with POWERLINE 3680 prior to discharge enables the chlorine residuals and contact time in the cooling system to be adjusted to maximize biological control while still meeting permit limitations on the discharge stream. Dechlorination of cooling water discharge is recognized as proven technology by the Federal Regulations. Dechlorination costs are a fraction of the cost of chlorination since only the chlorine residual remaining after the demand has been satisfied must be dechlorinated.

The use of POWERLINE 3680 in conjunction with chlorine is generally a safer and less expensive option than the use of more costly alternative biocides.

TREATMENT AND FEEDING REQUIREMENTS

The normal treatment levels for POWERLINE 3680 is dependent on the required reduction in total chlorine residual. Approximately 2 ppm of POWERLINE 3680 are required for each ppm reduction in total residual chlorine.

POWERLINE 3680 should be added to the cooling water discharge line in a manner which will provide adequate mixing prior to discharge. Systems designed for automatic feed of POWERLINE 3680 are available from BETZ.

Type 316L stainless steel and most common plastics are acceptable for handling POWERLINE 3680. Mild steel and copper are not recommended for use in feed system components.

GENERAL PROPERTIES

Appearance	yellow liquid
Density (70F)	11.7 lbs/gal
Flash Point (closed cup)	>200F
Freeze Point	10F
Pour Point	15F
Brookfield Viscosity (70F)	26 cps
(40F)	36 cps
pH (undiluted)	4.9
(5% solution)	5.1

If product becomes frozen during shipment or storage, thaw completely and mix until homogeneous.

SAFETY PRECAUTIONS

A Material Safety Data Sheet containing detailed information relative to this product is available upon request.

STORAGE AND PACKAGING INFORMATION

POWERLINE 3680 is blended as a liquid and supplied in 55 gallon, bung-type nonreturnable lined steel drums. Approximate net weight—630 pounds per drum. POWERLINE 3680 is also available in bulk quantities.

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

PRODUCT : POWERLINE 3680

EFFECTIVE DATE:04-13-9
PRINTED: 04-13-93

REVISIONS TO SECTIONS: 1,APP

PRODUCT APPLICATION:WATER-BASED DECHLORINATION AGENT.

-----SECTION 1----------HAZARDOUS INGREDIENTS----------

INFORMATION ON PHYSICAL HAZARDS,HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION.THIS PRODUCT IS SUBJECT TO THE PENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

AMMONIUM BISULFITE***CAS# 10192-30-0; CORROSIVE(EYES);IRRITANT(SKIN); PEL:NOT DETERMINED;TLV:NOT DETERMINED

AMMONIUM SULFITE***CAS# 10196-04-0; POTENTIAL RESPIRATORY IRRITANT; PEL:NOT DETERMINED;TLV:NOT DETERMINED.

AMMONIUM SULFATE***CAS# 7783-20-2; EYE AND SKIN IRRITANT; PEL:NOT DETERMINED;TLV:NOT DETERMINED

NONHAZARD INGREDIENTS: WATER(CAS# 7732-18-5)

-----SECTION 2----------TYPICAL PHYSICAL DATA----------

PH: AS IS(APPROX.) 5.3	ODOR: MUSTY
FL.PT.(DEG.F):> 200 P-M(CC)	SP.GR.(70F): 1.329
VAPOR PRESSURE(mmHG): 35.0	VAPOR DENSITY(AIR=1): < 1.00
VISC cps70F: 26	%SOLUBILITY(WATER): 100.0
EVAP RATE: < 1.00(ETHER=1)	APPEARANCE: YELLOW TO GREEN
PHYSICAL STATE:LIQUID	FREEZE POINT(DEG.F): -22.00

-----SECTION 3----------REACTIVITY DATA----------

STABLE. BETZ TANK CLEAN-OUT CATEGORY 'B'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

PRODUCT : POWERLINE 3680

----SECTION 4---------HEALTH HAZARD EFFECTS----------

SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
CORROSIVE TO SKIN

CUTE EYE EFFECTS ***
CORROSIVE TO THE EYES

CUTE RESPIRATORY EFFECTS ***
MISTS/AEROSOLS CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

HRONIC EFFECTS OF OVEREXPOSURE***
PROLONGED OR REPEATED CONTACT MAY CAUSE TISSUE NECROSIS AND/OR DERMATITIS.

EDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

YMPTOMS OF EXPOSURE ***
CAUSES SEVERE IRRITATION,BURNS OR TISSUE ULCERATION WITH SUBSEQUENT SCARRING.

----SECTION 5----------FIRST AID INSTRUCTIONS----------

KIN CONTACT ***
REMOVE CLOTHING.WASH AREA WITH LARGE AMOUNTS OF SOAP SOLUTION OR WATER FOR 15 MIN.IMMEDIATELY CONTACT PHYSICIAN

YE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

NHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA.APPLY NECESSARY FIRST AID TREATMENT.IMMEDIATELY CONTACT A PHYSICIAN.

NGESTION***
NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
LUTE CONTENTS OF STOMACH.INDUCE VOMITING BY ONE OF THE STANDARD METHODS.IMMEDIATELY CONTACT A PHYSICIAN

---SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS----------

PILL INSTRUCTIONS***
VENTILATE,AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER.THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD SAND/GRIT.

ISPOSAL INSTRUCTIONS****
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
INCINERATE OR BURY IN APPROVED LANDFILL

IRE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

PRODUCT : POWERLINE 3680

-----SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------

. E PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134.US
RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
VENTILATION PROTECTION***
ADEQUATE VENTILATION
RECOMMENDED RESPIRATORY PROTECTION***
IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE RESPIRATOR WITH ACID GASSES CARTRIDGES AND DUST/MIST PREFILTERS
RECOMMENDED SKIN PROTECTION***
GAUNTLET-TYPE RUBBER GLOVES,CHEMICAL RESISTANT APRON
WASH OFF AFTER EACH USE REPLACE AS NECESSARY.
RECOMMENDED EYE PROTECTION***
SPLASH PROOF CHEMICAL GOGGLES.FACE SHIELD

-----SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------
STORAGE INSTRUCTIONS***
KEEP CONTAINERS CLOSED WHEN NOT IN USE.
STORE IN COOL,DRY LOCATION AWAY FROM ACIDS AND ALKALIES
HANDLING INSTRUCTIONS***
CORROSIVE TO SKIN.CORROSIVE TO EYES.

****

THIS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD

****

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE. ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY
...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
753 GALLONS DUE TO AMMONIUM BISULFITE;9,033 GALLONS DUE TO AMMONIUM SULFITE;
...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE IDENTIFICATION NUMBER IS:D002=CORROSIVE(SKIN)
...DOT HAZARD/UN#/ER GUIDE# IS :CORROSIVE TO SKIN/NA2693/#60
...CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS:NONE
...SARA SECTION 302 CHEMICALS:NONE
...SARA SECTION 313 CHEMICALS:; AMMONIUM SULFATE(CAS# 7783-20-2), 0.1-1.0%
...SARA SECTION 312 HAZARD CLASS:IMMEDIATE(ACUTE);DELAYED(CHRONIC)
...MICHIGAN CRITICAL MATERIALS: NONE
NFPA/HMIS : HEALTH - 3; FIRE - 0; REACTIVITY - 0; SPECIAL - CORR; PE - D

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: POWERLINE 3680 May 17, 1994

AQUATIC TOXICOLOGY

Fathead Minnow 96 Hour Static Renewal Bioassay

Lowest Effect Level: 200 mg/L
0% Mortality: 100

Daphnia magna 48 Hour Static Screen

100% Mortality: 250 mg/L
0% Mortality: 100

Bluegill Sunfish 48 Hour Static Screen

100% Mortality: 500 mg/L
0% Mortality: 100

BIODEGRADATION

COD (mg/gm): 83
TOC (mg/gm): Inorganic, N/A

BOD-5 (mg/gm): Inorganic, N/A
BOD-28 (mg/gm): Inorganic, N/A

Closed Bottle Test
% Degradation in 28 days: Inorganic, N/A

Zahn-Wellens Test
% Degradation in 28 days: Inorganic, N/A

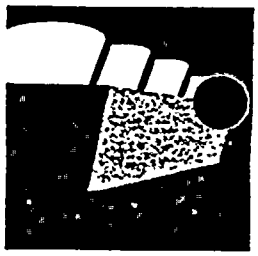
MAMMALIAN TOXICOLOGY

Oral LD50 RAT: >500 MG/KG
Note - ESTIMATED VALUE

Dermal LD50 RABBIT: >1,500 MG/KG
Note - ESTIMATED VALUE

BETZ Industrial

product facts



BETZ® Bio-Trol™ 88P
MICROBIOCIDE

EPA Reg No. 5785-57-3876

- Fast-dissolving granular form
- High concentration of actives
- Rapidly generates effective halogen concentrations
- Effective on bacterial, fungal, and algal fouling
- Long-lasting, controlled-protection biocide release

DESCRIPTION AND USE

Betz Bio-Trol 88P is an effective, broad-spectrum microbiocide in a concentrated granular form. The product contains active bromine and chlorine in a stabilized form; they are released into the water in a controlled fashion as the granules dissolve. Bromine and chlorine work together to provide effective control for a broad spectrum of slime-forming organisms. By controlling slime accumulations, Bio-Trol 88P allows cooling towers and heat exchangers to operate at peak efficiency and reduces the tendency for microbiologically induced corrosion (MIC.)

Bio-Trol 88P is particularly well-suited for applications that require shock dosing. For example, the rapid dissolution rates typical of this product make possible cost effective biofouling control of utility surface condensers without exceeding total residual oxidant discharge limits.

Betz Bio-Trol 88P may be used alternately with other Betz® Slimicides to improve overall program effectiveness by reducing the development of microorganism strains that become resistant to a single biocidal agent. Bio-Trol 88P is registered with the Environmental Protection Agency for the control of bacterial, fungal, and algal slimes. Bio-Trol 88P can be used in:

- commercial and industrial cooling towers
- once-through and closed-cycle fresh and sea water cooling systems
- brewery pasteurizers
- industrial air washer systems equipped with a mist eliminator under agitation
- influent water systems, such as flow-through filters and lagoons
- industrial water scrubbing systems

TREATMENT AND FEEDING REQUIREMENTS

In larger applications, a by-pass feeder is recommended to achieve consistent product residuals throughout the system. Betz offers a full range of feeder systems for applying Bio-Trol 88P. For small systems, Betz Bio-Trol 88P can be fed directly to the cooling water, pasteu[illegible] or air washer by means of a plastic or stainless steel feed device, such as a mesh bag or perforated container that provides gradual dissolution.

Proper treatment levels for Betz Bio-Trol 88P depend on many factors such as the nature and degree of severity of the microbial problem, system retention time, temperature, and other operating conditions. Typically, enough Betz Bio-Trol 88P is added to the system to achieve a 2-3 mg/L total halogen residual in the water for 1-4 hr daily. For best results, your Betz Industrial representative will determine the proper dosage for the specific system and the problem to be treated.

In all cases, the product must be applied in accordance with the use instructions on the Betz Bio-Trol 88P product label.

GENERAL PROPERTIES

Bromo-chloro hydantoin	96.0%
Inert Ingredients	4.0%
Appearance	white granules
Bulk Density	64.5 lb/ft ^{3} (1033 kg/m^3)
Solubility	1%
pH (5% dispersion)	4.7

PRINTED IN USA

ENVIRONMENTAL INFORMATION

Aquatic Toxicology Information—

nbow trout: 96 hr static acute bioassay-
LC50: 0.85 mg/L

Fathead minnow: 96 hr static acute bioassay-
LC50: 2.19 mg/L

Daphnia magna: 48 hr static acute bioassay-
LC50: 0.45 mg/L

Sheephead minnow: 96 hr static acute bioassay
LC50:19.5 mg/L

Grass shrimp: 96 hr static acute bioassay-
LC50: 12.66 mg/L

American oyster: 96 hr static acute bioassay-
LC50: >623 mg/L

Two Hour Daily Application

Daphnia magna: 48 hr LC50: 1.66 mg/L
Total residual oxidizer: 0.53 ppm

Rainbow trout: 96 hr LC50: 1.17 mg/L
Total residual oxidizer: 0.50 mg/L

Dehalogenated Product (5,5 dimethylhydantoin) –

Daphnia magna: 48 hr LC 50: 1266 mg/L

Fathead minnow: 96 hr LC50: 7890 mg/L

Rainbow trout: 96 hr LC50: 5940 mg/L

Grass shrimp: 96 hr LC50: 11,688 mg/L

Sheephead minnow: 96 hr LC50: 12,954 mg/L

American oyster: 96 hr LC50: 13,830 mg/L

SAFETY PRECAUTIONS

A Material Safety Data Sheet containing detailed information relative to this product is available upon request.

PACKAGING INFORMATION

Betz Bio-Trol 88P comes in granular form. It is available in a wide variety of customized containers and delivery methods. Contact your Betz Industrial representative for details.

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

PRODUCT : BIO-TROL 88P

EFFECTIVE DATE:03-29-94
PRINTED: 03-29-94

REVISIONS TO SECTIONS: APP

PRODUCT APPLICATION:SOLID MICROBIAL CONTROL AGENT.

---SECTION 1----------HAZARDOUS INGREDIENTS----------

INFORMATION ON PHYSICAL HAZARDS,HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION.THIS PRODUCT IS SUBJECT TO THE PENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

1-BROMO-3-CHLORO-5,5-DIMETHYLHYDANTOIN***CAS# 32718-18-6;OXIDIZER;EYE AND SKIN IRRITANT; PEL:NOT DETERMINED;TLV:NOT DETERMINED; NOTE-MANUFACTURER'S RECOMMENDED LIMIT:0.2MG/M3

NONHAZARD INGREDIENTS: IMPURITY(CAS# NOT ASSIGNED)

-----SECTION 2----------TYPICAL PHYSICAL DATA----------

PH: 5% DISP.(APPROX.) 4.7	ODOR: SLIGHT
FL.PT.(DEG.F):> 200 P-M(CC)	DENSITY:NO DATA
VAPOR PRESSURE(mmHG): < 1.0	VAPOR DENSITY(AIR=1): < 1.00
VISC cps70F: NA	%SOLUBILITY(WATER): 0.2
EVAP RATE: < 1.00(ETHER=1)	APPEARANCE: WHITE
PHYSICAL STATE:GRANULES	FREEZE POINT(DEG.F): NA

-----SECTION 3----------REACTIVITY DATA----------

STABLE. OXIDIZER. SLOWLY RELEASES HALOGEN GASES WHEN CONTAMINATED WITH MOISTURE. MAY REACT WITH ALKALIES, ACIDS, ORGANICS OR REDUCING AGENTS. DO NOT CONTAMINATE. BETZ TANK CLEAN-OUT CATEGORY 'B'.

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

RODUCT : BIO-TROL 88P

----SECTION 4---------HEALTH HAZARD EFFECTS----------

U SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
MODERATELY IRRITATING.MAY BE CORROSIVE IN CONTACT WITH MOIST SKIN.

CUTE EYE EFFECTS ***
SEVERE IRRITANT TO THE EYES

CUTE RESPIRATORY EFFECTS ***
DUSTS CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

HRONIC EFFECTS OF OVEREXPOSURE***
NO EVIDENCE OF POTENTIAL CHRONIC EFFECTS.

EDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

YMPTOMS OF EXPOSURE ***
MAY CAUSE REDNESS OR ITCHING OF SKIN.

RECAUTIONARY STATEMENT BASED ON TESTING RESULTS ***
MAY BE TOXIC IF ORALLY INGESTED.

----SECTION 5----------FIRST AID INSTRUCTIONS----------

KIN CONTACT ***
REMOVE CLOTHING.WASH AREA WITH LARGE AMOUNTS OF SOAP SOLUTION OR WATER FOR 15 MIN:IMMEDIATELY CONTACT PHYSICIAN

YE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

NHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA.APPLY NECESSARY FIRST AID TREATMENT.IMMEDIATELY CONTACT A PHYSICIAN.

NGESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DO NOT INDUCE VOMITING.IMMEDIATELY CONTACT PHYSICIAN. DILUTE CONTENTS OF S MACH USING 3-4 GLASSES MILK OR WATER

---SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS----------

PILL INSTRUCTIONS***
VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.SPILLED MATERIAL WHICH CAN NOT BE RECOVERED FOR RE-USE ,SHOULD BE PLACED IN A WASTE DISPOSAL CONTAINER AND DISPOSED OF IN AN APPROVED PESTICIDE LANDFILL.SEE PRODUCT LABEL STORAGE AND DISPOSAL INSTRUCTIONS.
PRODUCT RELEASES CHLORINE WHEN WET.SPILL RESIDUE MAY BE NEUTRALIZED WITH 3% HYDROGEN PEROXIDE SOLUTION.

ISPOSAL INSTRUCTIONS****
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
DISPOSE OF IN APPROVED PESTICIDE FACILITY OR ACCORDING TO LABEL INSTRUCTIONS

IRE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
FLOOD WITH WATER.USE OF CO2 OR FOAM MAY NOT BE EFFECTIVE.

PRODUCT : BIO-TROL 88P

----SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------

E PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134.USE RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.

VENTILATION PROTECTION***

ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS

RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY, USE RESPIRATOR WITH ACID GASSES CARTRIDGES AND DUST/MIST PREFILTERS

RECOMMENDED SKIN PROTECTION***

GAUNTLET-TYPE RUBBER GLOVES,CHEMICAL RESISTANT APRON

WASH OFF AFTER EACH USE REPLACE AS NECESSARY.

RECOMMENDED EYE PROTECTION***

AIRTIGHT CHEMICAL GOGGLES

-----SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------

STORAGE INSTRUCTIONS***

KEEP CONTAINERS CLOSED WHEN NOT IN USE.

KEEP DRY. DO NOT STORE AT HIGH TEMPERATURE OR NEAR OXIDIZABLES OR COMBUSTIBLES

HANDLING INSTRUCTIONS***

OXIDIZER.AVOID ALL CONTACT WITH REDUCING AGENTS, OILS, GREASES, ORGANICS AND ACIDS.

****

THIS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD

****

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

...TSCA: THIS IS AN EPA REGISTERED BIOCIDE AND IS EXEMPT FROM TSCA INVENTORY REQUIREMENTS

...FIFRA(40CFR):EPA REG.NO.: 3876- 150

...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:

NO REGULATED CONSTITUENT PRESENT AT OSHA THRESHOLDS

...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE IDENTIFICATION NUMBER IS:D001=IGNITABLE

...DOT HAZARD/UN#/ER GUIDE# IS :OXIDIZER/UN1479/#35

...CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS:

NO REGULATED CONSTITUENT PRESENT AT OSHA THRESHOLDS

...SARA SECTION 302 CHEMICALS:

NO REGULATED CONSTITUENT PRESENT AT OSHA THRESHOLDS

...SARA SECTION 313 CHEMICALS:

NO REGULATED CONSTITUENT PRESENT AT OSHA THRESHOLDS

...SARA SECTION 312 HAZARD CLASS:IMMEDIATE(ACUTE);FIRE

...MICHIGAN CRITICAL MATERIALS:

NO REGULATED CONSTITUENT PRESENT AT OSHA THRESHOLDS

NFPA/HMIS : HEALTH - 2; FIRE - 1; REACTIVITY - 1; SPECIAL - OXY ; PE - C

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: BIO-TROL 88P May 17, 1994

AQUATIC TOXICOLOGY

NO DATA AVAILABLE

BIODEGRADATION

NO DATA AVAILABLE

MAMMALIAN TOXICOLOGY

Oral LD50 RAT: 578 MG/KG
Note - 600 MG/KG PER ALT. SOURCE; DEHALOGENATED BYPRODUCT RAT ORAL LD50: >4,000 MG/KG

Dermal LD50 RABBIT: >2,000 MG/KG
Note - ALTERNATE SOURCE CONCURS

Inhalation LC50 RAT: 1.88 MG/L/4HR
Note - >3.2 MG/L/4HR AT 100 PPM (NO DEATHS) PER ALTERNATE SOURCE

Skin Irritation Score RABBIT: 6.1
Note - 6.98 PER ALTERNATE SOURCE; REVERSIBLE; DEHALOGENATED BYPRODUCT SCORE: 0.8

Eye Irritation Score RABBIT: 103
Note - 14 DAY-IRREVERSIBLE-MAX.AT DAY 3; DEHALOGENATED BYPRODUCT SCORE: 12.8-REVERSIBLE

90 Day Feed Study RAT: NO DATA
Note - DEHALOGENATED BYPRODUCT 90-DAY ORAL LD50: >2,000 MG/KG/DAY

Skin Sensit. Patch G.PIG: POSITIVE
Note - BUEHLER TEST; DEHALOGENATED BYPRODUCT WAS NEGATIVE IN BUEHLER TEST

Ames Assay BACTERIA: NEGATIVE
Note - +/- METABOLIC ACTIVATION; DEHALOGENATED BYPRODUCT: NEGATIVE

Non-Ames Mutagenicity YEAST: NEGATIVE
Note - DEHALOGENATED BYPRODUCT NEGATIVE FOR: MOUSE LYMPHOMA, SCE, CELL TRANSFORMATION

Teratology RAT: NO DATA
Note - DEHALOGENATED BYPRODUCT STUDY HAD TERATA (SECONDARY) AT MATERNAL TOXIC DOSES

Reproductive Toxicity RAT: 4,500 MG/KG/DAY

Note - DEHALOGENATED BYPRODUCT STUDY HAD NO ADVERSE REPRODUCTIVE TOXICITY

Material Safety Data Sheet

Required under USDL Safety and Health Regulations for Shipyard Employment (29 CFR 1915)

U.S. Department of Labor
Occupational Safety and Health Administration

32.38

OMB No. 1218-0074
Expiration Date 05/31/86

Section I

Manufacturer's Name: Hennigan Engineering Co., Inc.

Emergency Telephone Number: (617) 331-3322

Address (Number, Street, City, State, and ZIP Code): 86 Finnell Drive, Weymouth, MA 02188

Chemical Name and Synonyms: Sodium Polymethacrylate

Trade Name and Synonyms: 4E-50

Chemical Family: Carboxylated polyelectrolyte

Formula:

Section II - Hazardous Ingredients NOT APPLICABLE

Paints, Preservatives, and Solvents	%	TLV (Units)	Alloys and Metallic Coatings	%	TLV (Units)
Pigments			Base Metal		
Catalyst			Alloys		
Vehicle			Metallic Coatings		
Solvents			Filler Metal Plus Coating or Core Flux		
Additives			Others		
Others					

Hazardous Mixtures of Other Liquids, Solids or Gases

	%	TLV (Units)

Section III - Physical Data

Boiling Point (°F)	About 212°F	Specific Gravity (H_2O=1)	About 1.1
Vapor Pressure (mm Hg)	Same as water	Percent Volatile by Volume (%)	About 75% water
Vapor Density (AIR=1)	N.A.	Evaporation Rate (_____=1)	Equal to water

Solubility in Water: Miscible — pH: About 10 to 11

Appearance and Odor: Clear to pale yellow liquid - No odor

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used) (°F/°C):	Flammable Limits	Lel	Uel
>212/100 - Closed Cup		N.A.	N.A.

Extinguishing Media: Liquid product does not burn

Special Fire Fighting Procedures: None

Unusual Fire and Explosion Hazards: None

Section V - Health Hazard Data

Threshold Limit Value

None Established

Effects of Overexposure

No acute adverse effects known. Test data indicates that product is not an eye or skin irritant. Any risk of ingestion injury would be related to pH range of 10 to 11. Swallowing significant amounts of liquid may cause caustic burns to gastrointestinal tract. No inhalation hazard expected.

Emergency First Aid Procedures

Eye contact-Flush immediately with large amounts of water for 15 minutes, repeatedly holding eyelids open. Call a physician if an irritation persists.
Skin Contact - Wash with plenty of soap and water.
Ingestion - Call physician immediately if significant amounts have been swallowed. Give the patient large amounts of water or milk to drink for dilution effect. No inhalation hazard expected.

Section VI - Reactivity Data

Stability	Unstable		Conditions to Avoid: N.A.
	Stable	X	

Incompatability (Materials to Avoid)

None

Hazardous Decomposition Products

None

Hazardous Polymerization	May Occur		Conditions to Avoid: Uncontrolled polymerization: N.A.
	Will Not Occur	X	

Section VII - Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled

Prevent liquid from entering drinking water supplies or streams. Collect liquid or solidified with absorbent material and package for disposal according to local, state, and federal regulations.

Waste Disposal Method

This product as sold within its pH specification range is not a federal hazardous waste according to EPA regulations 40 CFR 261. Dispose of waste product in accordance with state and local regulations for polymer waste.

Section VIII - Special Protection Information

Respiratory Protection (Specify Type)

Not normally required.

Ventilation	Local Exhaust	Special
	Mechanical (General) Typical systems are sufficient for simple mixing.	Other

Protective Gloves: Impervious rubber gloves.

Eye Protection: Chemical safety goggles with side shield Generally-do not wear contact lenses when handling chemicals.

Other Protective Equipment

None

Section IX - Special Precautions

Precautions to be Taken in Handling and Storing

None

Precautions

None

Betz Industrial
The Water Management Division of Betz Laboratories, Inc.

product facts

BETZ® POWERLINE™ 3450
Deposit Control Agent

- **Patented calcium phosphate scale inhibitor**
- **Permits proper phosphate concentration for complete corrosion inhibition of mild steel**
- **Effective general dispersant for silt, iron, and calcium fouling**
- **Compatible with chlorination**

DESCRIPTION AND USE

POWERLINE 3450 is a special organic deposit control agent designed to control calcium phosphate formation in open recirculating cooling water systems in the Power Industry. The use of this product for the control of the formation and/or deposition of calcium and magnesium phosphates and silicates, iron oxide, clay, or mixtures thereof is covered by U.S. Patent 4,029,577. Its use in conjunction with POWERLINE 3040 or POWERLINE 3080 is also covered by U.S. Patent 4,303,568.

TYPICAL APPLICATIONS

POWERLINE 3450 is a patented calcium phosphate scale inhibitor, designed for Power Industry cooling systems with high concentrations of phosphate in the makeup water or to be applied in conjunction with certain phosphate-based POWERLINE corrosion inhibitors. With POWERLINE 3450, phosphate concentrations can be carried high enough to attain the desired mild steel corrosion protection formerly produced only by effective chromate based programs. POWERLINE 3450 is also a highly effective general dispersant for silt, iron, and calcium fouling. Figures 1 and 2 illustrate the deposit control capabilities of POWERLINE 3450.

TREATMENT AND FEEDING REQUIREMENTS

POWERLINE 3450 should be fed to a point in the cooling water system where turbulence and flow patterns will ensure adequate mixing of the product with the cooling water. In recirculating cooling systems the product should be fed continuously to maintain consistent residuals in the cooling water. Intermittent product feed is applicable in certain once-through cooling systems.

POWERLINE 3450 may be fed directly from the shipping container or diluted with water to any convenient feeding strength.

Tanks, pumps, piping and valves may be made of stainless steel or most common plastics. Avoid the use of mild steel and copper alloys.

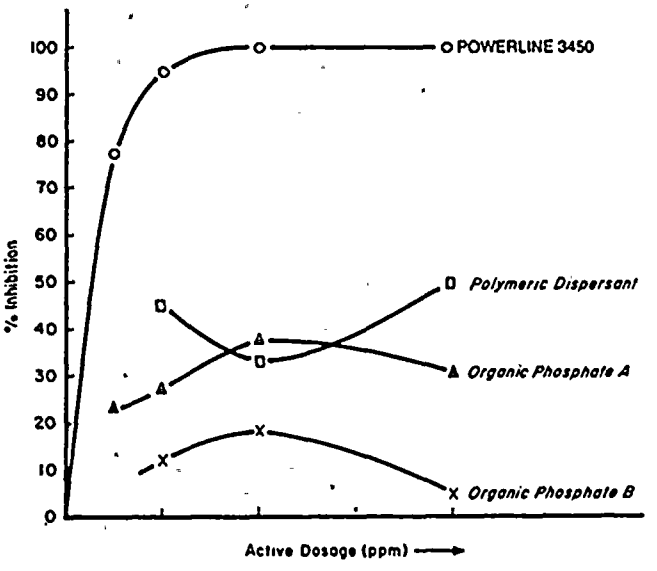


FIGURE 1—The superior ability of POWERLINE 3450 to control orthophosphate deposition. POWERLINE 3450 provided 96 to 98% inhibition of calcium phosphate precipitation as compared to 13-43% by conventional cooling water dispersants.

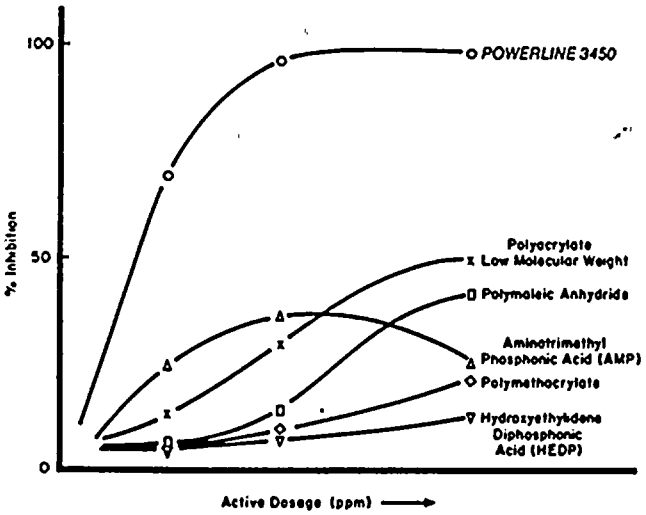


FIGURE 2—The ability of POWERLINE 3450 to inhibit calcium orthophosphate deposition at normally recommended POWERLINE corrosion inhibitor control limits. Compared to other conventional cooling water deposit control agents, the performance of POWERLINE 3450 is a significant improvement.

GENERAL PROPERTIES

Appearance	light yellow liquid
Density (70F)	9.3 lbs/gal
Flash Point (closed cup)	>200F
Freeze Point	26F
Pour Point (ASTM)	31F
pH (undiluted)	5.3
(5% solution)	5.9
Specific Gravity (70F)	1.12
Viscosity (70F)	19.5 cps
(40F)	35 cps
Freeze/Thaw Recovery (3 cycles)	Stable

PACKAGING INFORMATION

POWERLINE 3450 is blended as a liquid, and is supplied in 55-gallon bung-type nonreturnable lined steel drums. Approximate net weight—500 pounds per drum. In addition, POWERLINE 3450 is available under the BETZ Point Of Feed® Service Program for contracted quantities in certain geographic areas.

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

ODUCT : POWERLINE 3450

EFFECTIVE DATE 02-16-91
PRINTED: 8-Apr-1991

ODUCT APPLICATION : WATER-BASED DEPOSIT CONTROL AGENT.

---SECTION 1----------HAZARDOUS INGREDIENTS----------

FORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC ODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS STED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE D CHRONIC HAZARDS OF THIS FORMULATION. THIS PRODUCT IS SUBJECT TO THE NNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

IS PRODUCT IS NOT HAZARDOUS AS DEFINED BY OSHA, PENNSYLVANIA, OR NEW JERSEY GHT TO KNOW REGULATIONS

NHAZARD INGREDIENTS: WATER(7732-18-5) ; ACRYLIC ACID COPOLYMER WITH HYDROXY OPYL ACRYLATE(39373-34-7)

---SECTION 2----------TYPICAL PHYSICAL DATA----------

: AS IS (APPROX.) 5.3	ODOR: MILD
.PT.(DEG.F): >200 SETA(CC)	SP.GR.(70F)OR DENSITY: 1.123
POR PRESSURE(mmHG): 20	VAPOR DENSITY(AIR=1): <1
SC cps70F: 19.5	%SOLUBILITY(WATER): 100
AP.RATE: <1 ETHER=1	APPEARANCE: LIGHT YELLOW
YSICAL STATE: LIQUID	FREEZE POINT(DEG.F): 26

---SECTION 3----------REACTIVITY DATA----------

ABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK EAN-OUT CATEGORY 'A'

ERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

PRODUCT: POWERLINE 3450

-----SECTION 4----------HEALTH HAZARD EFFECTS----------

ACUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
SLIGHTLY IRRITATING TO THE SKIN

TE EYE EFFECTS ***
SLIGHTLY IRRITATING TO THE EYES

ACUTE RESPIRATORY EFFECTS ***
MISTS/AEROSOLS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

CHRONIC EFFECTS OF OVEREXPOSURE***
NO EVIDENCE OF POTENTIAL CHRONIC EFFECTS.

MEDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

SYMPTOMS OF EXPOSURE ***
MAY CAUSE REDNESS OR ITCHING OF SKIN,IRRITATION AND/OR TEARING OF EYES(DIRECT CONTACT).

-----SECTION 5----------FIRST AID INSTRUCTIONS----------

SKIN CONTACT***
REMOVE CONTAMINATED CLOTHING.WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR.APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY

INGESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM DILUTE CONTENTS OF STOMACH.INDUCE VOMITING BY ONE OF THE STANDARD METHODS.IMMEDIATELY CONTACT A PHYSICIAN

-----SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS---------

SPILL INSTRUCTIONS***
VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL, SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS***
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA: DRY CHEMICAL/CO2/FOAM OR WATER. SLIPPERY CONDITION. USE SAND/GRIT

ODUCT: POWERLINE 3450

---SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------

E PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE
SPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
NTILATION PROTECTION***
ADEQUATE VENTILATION
COMMENDED RESPIRATORY PROTECTION***
IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH DUST/MIST FILTERS.
COMMENDED SKIN PROTECTION***
RUBBER GLOVES
WASH OFF AFTER EACH USE.REPLACE AS NECESSARY
COMMENDED EYE PROTECTION***
SPLASH PROOF CHEMICAL GOGGLES

---SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------

ORAGE INSTRUCTIONS***
KEEP DRUMS & PAILS CLOSED WHEN NOT IN USE.
PROTECT FROM FREEZING
NDLING INSTRUCTIONS***
NORMAL CHEMICAL HANDLING

****

IS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD

****

APPENDIX: REGULATORY INFORMATION

CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
ECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
Y CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

.TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE TSCA INVENTORY
.REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
T APPLICABLE
.RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE
ENTIFICATION NUMBER IS: NOT APPLICABLE
.DOT HAZARD/UN#/ER GUIDE# IS: NOT APPLICABLE
.CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS: NONE
.SARA SECTION 302 CHEMICALS: NONE
.SARA SECTION 313 CHEMICALS:-NONE
.SARA SECTION 312 HAZARD CLASS: PRODUCT IS NONHAZARDOUS UNDER SECTION 311/312
.MICHIGAN CRITICAL MATERIALS: NONE
PA/HMIS : HEALTH - 1 ; FIRE - 1 ; REACTIVITY - 0 ; SPECIAL - NONE ; PE - B

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: POWERLINE 3450 May 17, 1994

AQUATIC TOXICOLOGY

Fathead Minnow 96 Hour Static Acute Bioassay

LC50: 19062 mg/L
No Effect Level: 8700

Daphnia magna 48 Hour Static Acute Bioassay

LC50: 3558 mg/L
No Effect Level: 2400

Bluegill Sunfish 48 Hour Static Screen

0% Mortality: 4000 mg/L

BIODEGRADATION

NO DATA AVAILABLE

MAMMALIAN TOXICOLOGY

Oral LD50 RAT: 16,000 MG/KG

Dermal LD50 RABBIT: 2,000 MG/KG

BETZ LABORATORIES,INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19053
BETZ MATERIAL SAFETY DATA SHEET
EMERGENCY TELEPHONE (HEALTH/ACCIDENT) 800-877-1940

RODUCT : PRE-FILM 108L

EFFECTIVE DATE:09-17-92
PRINTED: 09-17-92

REVISIONS TO SECTIONS: 1

RODUCT APPLICATION : PRE-CLEANING/PRE-FILMING AGENT.

----SECTION 1----------HAZARDOUS INGREDIENTS----------

NFORMATION ON PHYSICAL HAZARDS,HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC RODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS ISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE ND CHRONIC HAZARDS OF THIS FORMULATION.THIS PRODUCT IS SUBJECT TO THE ENNSYLVANIA AND NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW LAW.

SODIUM ACID PYROPHOSPHATE(SAPP.)***CAS# 7758-16-9; EYE IRRITANT; PEL:NONE; TLV:NONE;

ONHAZARD INGREDIENTS: WATER(CAS# 7732-18-5) TETRAPOTASSIUM PYROPHOSPHATE(CAS# 7320-34-5)

----SECTION 2----------TYPICAL PHYSICAL DATA----------

H: AS IS(APPROX.) 7.6	ODOR: NONE
L.PT.(DEG.F):> 200 SETA(CC)	SP.GR.(70F): 1.178
APOR PRESSURE(mmHG): ND	VAPOR DENSITY(AIR=1): ND
ISC cps70F: 13	%SOLUBILITY(WATER): 100.0
VAP RATE: < 1.00(ETHER=1)	APPEARANCE: COLORLESS
HYSICAL STATE:LIQUID	FREEZE POINT(DEG.F): 26.00

----SECTION 3----------REACTIVITY DATA----------

TABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK LEAN-OUT CATEGORY 'B'

HERMAL DECOMPOSTION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

PRODUCT : PRE-FILM 108L

------SECTION 4---------HEALTH HAZARD EFFECTS----------

UTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE
MAY CAUSE SLIGHT IRRITATION TO THE SKIN

ACUTE EYE EFFECTS ***
MODERATELY IRRITATING TO THE EYES

ACUTE RESPIRATORY EFFECTS ***
MISTS/AEROSOLS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

CHRONIC EFFECTS OF OVEREXPOSURE***
NO EVIDENCE OF POTENTIAL CHRONIC EFFECTS.

MEDICAL CONDITIONS AGGRAVATED ***
NOT KNOWN

SYMPTOMS OF EXPOSURE ***
MAY CAUSE REDNESS OR ITCHING OF SKIN.

-----SECTION 5----------FIRST AID INSTRUCTIONS----------

SKIN CONTACT ***
REMOVE CONTAMINATED CLOTHING.WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT***
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***
REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR.APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY

INGESTION***
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DILUTE CONTENTS OF STOMACH.INDUCE VOMITING BY ONE OF THE STANDARD METHODS.IMMEDIATELY CONTACT A PHYSICIAN

----SECTION 6----------SPILL,DISPOSAL AND FIRE INSTRUCTIONS----------

SPILL INSTRUCTIONS***
VENTILATE,AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER.THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS****
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-
INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS***
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

RODUCT : PRE-FILM 108L

----SECTION 7----------SPECIAL PROTECTIVE EQUIPMENT----------

ROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134.USE
SPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
ENTILATION PROTECTION***
ADEQUATE VENTILATION
ECOMMENDED RESPIRATORY PROTECTION***
IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH DUST/MIST FILTERS.
ECOMMENDED SKIN PROTECTION***
RUBBER GLOVES
WASH OFF AFTER EACH USE REPLACE AS NECESSARY.
ECOMMENDED EYE PROTECTION***
SPLASH PROOF CHEMICAL GOGGLES

----SECTION 8----------STORAGE AND HANDLING PRECAUTIONS----------
TORAGE INSTRUCTIONS***
KEEP CONTAINERS CLOSED WHEN NOT IN USE.
DO NOT FREEZE.IF FROZEN,THAW AND MIX COMPLETELY PRIOR TO USE
ANDLING INSTRUCTIONS***
NORMAL CHEMICAL HANDLING

****

HIS MSDS WAS WRITTEN TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD

****

APPENDIX: REGULATORY INFORMATION

HE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
FFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
NY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

A: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY
REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
NOT APPLICABLE
.RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE
DENTIFICATION NUMBER IS:NOT APPLICABLE
.DOT HAZARD/UN#/ER GUIDE# IS : NOT APPLICABLE
.CALIFORNIA SAFE DRINKING WATER ACT (PROPOSITION 65) MATERIALS:NONE
.SARA SECTION 302 CHEMICALS:NONE
.SARA SECTION 313 CHEMICALS:NONE
.SARA SECTION 312 HAZARD CLASS:PRODUCT IS NON-HAZARDOUS UNDER SECTION
1/312
.MICHIGAN CRITICAL MATERIALS: NONE
NFPA/HMIS : HEALTH - 1; FIRE - 1; REACTIVITY - 0; SPECIAL - NONE; PE - B

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA 19053

PRODUCT: PRE-FILM 108L

May 17, 1994

AQUATIC TOXICOLOGY

Rainbow Trout 48 Hour Static Screen

0% Mortality: 1000 mg/L

Daphnia magna 48 Hour Static Screen

0% Mortality: 500 mg/L

BIODEGRADATION

NO DATA AVAILABLE

MAMMALIAN TOXICOLOGY

Oral LD50 RAT: >2,000 MG/KG
Note - ESTIMATED VALUE

Dermal LD50 RABBIT: >2,000 MG/KG
Note - ESTIMATED VALUE

32.73
ID 2114
8-16-91

JOHNSTON POLYMER COMPANY, INC.

P.O. Box 86 • Manvel, Texas 77578 • Phone (713) 489-9528

MATERIAL SAFETY DATA SHEET

SECTION I: PRODUCT INFORMATION

PRODUCT NAME: J-POLY 101C
CHEMICAL FAMILY: Sodium Polyacrylate
CAS NUMBER: 9003-04-7
EMERGENCY TELEPHONE NUMBER: 713-489-9528 or 713-980-7524
CHEMTREC (for emergency involving chemicals): 800-424-9300
EPA HOTLINE: 800-535-0202

SECTION II: HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENTS: None

SECTION III: PHYSICAL DATA

MOLECULAR WEIGHT: 1000	pH (as is): 7.0
PERCENT SOLIDS: 50	VISCOSITY, Cp at 77 F: 1200
PERCENT VOLATILE (Water): 50	SP. G. at 77 F: 1.36

SOLUBILITY IN WATER: Complete
APPEARANCE AND ODOR: Viscous liquid; clear to hazy
No characteristic odor

SECTION IV: FIRE AND EXPLOSION HAZARDS

FLASH POINT: None
EXPLOSIVE LIMITS: None
EXTINGUISHING MEDIA: Not applicable; product will not burn
NFPA CODES: HEALTH - 0, FLAMMABILITY - 0, REACTIVITY -0

SECTION V: HEALTH HAZARD DATA

Toxicological Information (Range Finding Studies):

Rat, Acute oral LD50	greater than 5g/kg
Rabbit, Acute dermal LD50	greater than 5g/kg
Rabbit, Eye irritation	slight
Rabbit, Skin irritation	none
Daphnia, 48 hour LC50	greater than 1000 ppm
Sunfish, 96 hour LC 50	greater than 1000 ppm
Trout, 96 hour LC50	greater than 1000 ppm

Product does not contain carcinogens subject to the reporting requirements of SARA TITLE III.

May cause irritation of skin and eyes. For eye contact, flush with water for 15 minutes; get medical attention if irritation persists. Wash skin with soap and water.

HMIS RATING HEALTH - 0, FLAMMABILITY - 0, REACTIVITY - 0

SECTION VI: REACTIVITY DATA

Product is stable; will not undergo hazardous polymerization.

SECTION VII: SPILL OR LEAK PROCEDURES

Dilute spill with small amount of water and use absorbent. Land fill in incinerate contaminated absorbent. Carry out disposal in accordance with federal, state and local regulations.

SECTION VIII: PROTECTIVE EQUIPMENT REQUIRED

Respiratory protection is not required. Use rubber gloves, boots and apron for direct handling. Use face shield or goggles for eye protection.

SECTION IX: SHIPPING INFORMATION/OTHER COMMENTS

DOT IDENTIFICATION NUMBER: N/A
DOT LABELS REQUIRED: None
REPORTABLE QUANTITY: N/A
BILL OF LADING DESCRIPTION: Cleaning/Washing Compound, NOI

PRECAUTIONARY MEASURES: Keep away from heat or open flame. Use with adequate ventilation. Do not breath vapors. Avoid prolonged or repeated contact with skin.

DEFINITIONS

NFPA RATING: System adopted by National Fire Protection Association to identify hazards in a fire situation:

0 = No known hazard
1 = Slight hazard
2 = Moderate hazard
3 = Severe hazard
4 = Extreme hazard

HMIS RATING: Hazardous Materials Identification System adopted by the National Paint & Coatings Association:

0 = Minimal hazard
1 = Slight hazard
2 = Moderate hazard
3 = Serious hazard
4 = Severe hazard
* = May be chronic

CAS NUMBER: Chemical Abstracts Service Number

SARA: Superfund Amendments Reauthorization Act of 1986 (also referred to as the "Emergency Planning and Community Right To Know Law of 1986")

DOT: Department of Transportation

Revised Feb. 1, 1990 Supercedes May, 1985

MATERIAL SAFETY DATA SHEET

CALGON CORPORATION

P.O. Box 1346
Pittsburgh, PA 15230-1346

24 Hour Emergency Telephone--(412)777-8000

Section 1. PRODUCT IDENTIFICATION

PRODUCT NAME: Geo-Guard 4813 (formerly called RP-813)

CHEMICAL DESCRIPTION: Aqueous solution
PRODUCT CLASS: Surface finishing
MSDS CODE: 0C42-06-02-93

Section 2. HAZARDOUS INGREDIENTS AND EXPOSURE LIMITS

Chemical Name	CAS Number	% by Weight	OSHA PEL	ACGIH TLV
Potassium carbonate	584-08-7	20	None established	None established

Section 3. HAZARDS IDENTIFICATION

********** EMERGENCY OVERVIEW **********

WARNING!
May cause eye irritation.
Repeated or prolonged contact may cause skin irritation.

****

PRIMARY ROUTES OF ENTRY: Eye and skin contact

TARGET ORGANS: Eye

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: No data available.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: This product may produce irritation upon contact with the eye.

SKIN CONTACT: Prolonged or repeated exposure may cause slight skin irritation. No data is available to suggest that this product may produce an allergic skin reaction or be absorbed through the skin in harmful amounts.

MATERIAL SAFETY DATA SHEET

INGESTION: Swallowing this product may irritate the gastrointestinal tract and cause nausea and vomiting.

INHALATION: This product is not expected to present an inhalation hazard.

SUBCHRONIC, CHRONIC:
No applicable information was found concerning any potential health effects resulting from subchronic or chronic exposure to the product.

CARCINOGENICITY:
NTP:
"No ingredients listed in this section"
IARC:
"No ingredients listed in this section"
OSHA:
"No ingredients listed in this section"

Section 4. FIRST AID MEASURES

EYE CONTACT: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Seek medical aid.

SKIN CONTACT: Not expected to require first aid measures.

INGESTION: Not an expected route of overexposure.

INHALATION: Not an expected route of overexposure.

Section 5. FIRE-FIGHTING MEASURES

FLASH POINT: None
This product is not by definition a "flammable liquid" or a "combustible liquid".

LOWER FLAMMABLE LIMIT: Not available UPPER FLAMMABLE LIMIT: Not available

AUTO-IGNITION TEMPERATURE: Not available

EXTINGUISHING MEDIA: Use extinguishing media appropriate for the surrounding fire.

FIRE-FIGHTING INSTRUCTIONS: Exercise caution when fighting any chemical fire. A self-contained breathing apparatus and protective clothing are essential.

FIRE & EXPLOSION HAZARDS: No unusual hazards.

DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, disodium oxide, dipotassium oxide and sulfur oxides.

NFPA RATINGS: Health = 2 Flammability = 0 Reactivity = 0 Special Hazard = None

Hazard rating scale: 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

MATERIAL SAFETY DATA SHEET

Section 6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Wearing appropriate personal protective equipment, contain spill, collect onto inert absorbent and place into suitable container.

Section 7. HANDLING AND STORAGE

HANDLING: Avoid contact with eyes.
Avoid prolonged or repeated contact with skin and clothing.
Use with adequate ventilation.
Wash thoroughly after handling. Keep container closed when not in use.

STORAGE: No specific information.

Section 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

PERSONAL PROTECTIVE EQUIPMENT:

EYE/FACE PROTECTION: Chemical splash goggles
SKIN PROTECTION: Chemical resistant gloves recommended as a good industrial hygiene practice.
RESPIRATORY PROTECTION: Normally not required.

ENGINEERING CONTROLS: No specific recommendations.

WORK PRACTICES: An eye wash station should be accessible in the immediate area of use.

Section 9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: > 230°F

SOLUBILITY IN WATER: Complete

VAPOR PRESSURE: Not available

SPECIFIC GRAVITY: 1.18 - 1.20 @ 25°C

VAPOR DENSITY (air = 1): Not available

pH: 12.5

% VOLATILE BY WEIGHT: 80 (water)

FREEZING POINT: Not available

APPEARANCE AND ODOR: Clear, brown liquid.

Section 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: No specific information.

MATERIAL SAFETY DATA SHEET

INCOMPATIBILITY: Strong acids

DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, disodium oxide, dipotassium oxide and sulfur oxides.

Section 11. TOXICOLOGICAL INFORMATION

ON PRODUCT:
No information available on the formulated product.

ON INGREDIENTS:

Chemical Name	Oral LD_{50} (rat)	Dermal LD_{50} (rabbit)	Inhalation LC_{50} (rat)
Potassium carbonate	1870 mg/kg	Not available	Not available

Section 12. ECOLOGICAL INFORMATION

ON PRODUCT:
No information available on the formulated product.

ON INGREDIENTS:

Chemical Name	Aquatic Toxicity Data
"No ingredients listed in this section"	

Section 13. DISPOSAL CONSIDERATIONS

RCRA STATUS: Discarded product, as sold, would be considered a RCRA Hazardous Waste based on the characteristic of corrosivity. The EPA Hazardous Waste Number is D002.

DISPOSAL: Dispose of in accordance with local, state and federal regulations.

Section 14. TRANSPORT INFORMATION

DOT CLASSIFICATION:
Class/Division: Not restricted
Proper Shipping Name: Not applicable
Label: None
Packing Group: Not applicable
ID Number: Not applicable

Section 15. REGULATORY INFORMATION

OSHA Hazard Communication Status: Hazardous
TSCA: The ingredients of this product are listed on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory.

MATERIAL SAFETY DATA SHEET

CERCLA reportable quantity of EPA hazardous substances in product:

Chemical Name	RQ
No ingredients listed in this section	

Product RQ: Not applicable (Notify EPA of product spills exceeding this amount.)

SARA TITLE III:

Section 302 Extremely Hazardous Substances:

Chemical Name	CAS #	RQ	TPQ
No ingredients listed in this section			

Section 311 and 312 Health and Physical Hazards:

Immediate	Delayed	Fire	Pressure	Reactivity
[yes]	[no]	[no]	[no]	[no]

Section 313 Toxic Chemicals:

Chemical Name	CAS #	% by Weight
No ingredients listed in this section		

Section 16. OTHER INFORMATION

HMIS RATINGS: Health = 2 Flammability = 0 Reactivity = 0
Personal Protective Equipment = A

Hazard rating scale: 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

MSDS REVISION SUMMARY: Reason for reissue: Update to new format.

PREPARED BY: K.O. Martinelli

C-10.334

MATERIAL SAFETY DATA SHEET

For Coatings, Resins and Related Materials

1994

Printed : 06/10/

Revised : 02/04/

SECTION I - PRODUCT IDENTIFICATION

Manufacturer: STEWART-HALL CHEMICAL CORP.
222 WASHINGTON STREET
MT. VERNON NY 10553

Information Phone: 914-668-630
Emergency Phone: 800-424-930
CHEMTREC Phone: 800-424-930

Hazard Ratings: Health -
none -> extreme Fire -
0 ---> 4 Reactivity -

Personal Protection -

Product Class:
Trade Name : COIL-RITE
Product Code : C05080GD
C.A.S. Number: MIXTURE
Prepared By : HARVEY GRODJESK
Title : TECHNICAL DIRECTOR
D.O.T. Hazard Class : NOT HAZARDOUS UN #:
Proper Shipping Name: COMPOUND, CLEANING
Technical Name:

SECTION II - HAZARDOUS INGREDIENTS

Ingredients	CAS #	Weight %	Exposure Limits ACGIH/TLV		OSHA/PEL		VI mm
SODIUM METASILICATE	6834-92-0	3.01	2	mg/M3	2	mg/M3	0
SULFAMIC ACID	5329-14-6	2.54					0
ALCOHOL	67-63-0	1.94	400	ppm	400	ppm	3
		STEL =	500	ppm	500	ppm	
GLYCOL BUTYL ETHER	111-76-2	2.24	N.E.		PPM	N.E.	0
		STEL =	NA	N.E.	NA	N.E.	

*** ALL Ingredients in this product are listed in the T.S.C.A. Inventory.

N.E. = Not Established

SECTION III - PHYSICAL DATA

Boiling Range: 212
Evap. Rate: Faster than n-Butyl Acetate
Volatiles vol % 80 Wgt% 89.2

Vapor Density: Heavier than Air.
Liquid Density: Heavier than Wate
Wgt per gallon: 8.66 Pounds.
Spec. Gravity: 1.03962

Appearance: GREEN LIQUID. PLEASANT ODOR.
V.O.C.: 2.3

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flammability Class: NA Flash Point: NONE F TCC LEL: 1.10% UEL: 12.7

-EXTINGUISHING MEDIA:
NOT REQUIRED

-SPECIAL FIREFIGHTING PROCEDURES:
NONE REQUIRED

SECTION IV - FIRE AND EXPLOSION HAZARD DATA (cont.)

-UNUSUAL FIRE & EXPLOSION HAZARDS:
NONE
--FLAMMABILITY: (NONE = NO)

SECTION V - TOXICOLOGICAL PROPERTIES

-PERMISSIBLE EXPOSURE LEVEL:
NONE ESTABLISHED
-EFFECTS OF CHRONIC OVEREXPOSURE:
IF SWALLOWED MAY CAUSE NAUSEA AND BURN MUCOUS MEMBRANE. KEEP OUT OF EYES. CONCENTRATED PRODUCT IS CORROSIVE TO EYES.
-FIRST AID:
EYES: FLUSH WITH WATER FOR 15 MINUTES. IF IRRITATION PERSISTS SEE PHYSICIAN.
SKIN: FLUSH WITH WATER.
INGESTION: CONTACT PHYSICIAN IMMEDIATELY. COIL-RITE IS ALKALINE.
-EFFECTS OF ACUTE OVEREXPOSURE:
MAY IRRITATE SKIN. CORROSIVE TO EYES.
-ROUTE OF ENTRY
SKIN CONTACT, EYE CONTACT, INGESTION.
-EXPOSURE LIMITS
NONE ESTABLISHED.
-IRRITANCY OF PRODUCT
MILD
-SENSITIZATION TO PRODUCT
NONE
-CARCINOGENICITY
NONE
-TERATOGENICITY
NONE
-REPRODUCTIVE TOXICITY
NONE
-MUTAGENICITY
NONE
-SYNERGISTIC PRODUCTS
UNKNOWN

SECTION VI - PREVENTIVE MEASURE - REACTIVITY DATA

STABLITY: [ ] Unstable [x] Stable
HAZARDOUS POLYMERIZATION: [ ] May occur [x] Will not occur
-INCOMPATIBILITY
DO NOT MIX WITH ACIDS.
-CONDITIONS TO AVOID:
NONE

C-10.344

 STEWART-HALL CHEMICAL CORP. 3of4 828
Material Safety Data Sheet for: COIL-RITE(CS5080GD)

SECTION VI - PREVENTIVE MEASURE - REACTIVITY DATA (cont.)

-HAZARDOUS DECOMPOSITION PRODUCTS:
NONE

SECTION VII - PREVENTIVE MEASURES - SPILL OR LEAK PROCEDURES

-STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
FLUSH WITH PLENTY OF WATER.
-WASTE DISPOSAL METHOD:
DISPOSE IN ACCORDANCE WITH LOCAL, STATE OR FEDERAL REGULATIONS.

SECTION VIII - PREVENTIVE MEASURES - SPECIAL PROTECTION INFORMATION

-RESPIRATORY PROTECTION:
NIOSH APPROVED FOR ORGANICS IN ENCLOSED AREA.
-VENTILATION:
NORMAL VENTILATION.
-PROTECTIVE GLOVES:
RUBBER OR NEOPRENE GLOVES.
-EYE PROTECTION:
GOGGLES.
-OTHER PROTECTIVE EQUIPMENT:
NONE

SECTION IX - PREVENTIVE MEASURES - SPECIAL PRECAUTIONS

-PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
KEEP OUT OF REACH OF CHILDREN. KEEP FROM FREEZING.
-OTHER PRECAUTIONS:
AVOID PROLONGED CONTACT WITH SKIN.
DO NOT MIX WITH OTHER CHEMICALS.

SECTION X - ADDITIONAL REGULATORY INFORMATION

-SARA TITLE III SECTION 313:
This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right To Know Act of 1986 and of 40 CFR 372:

CAS#	Chemical Name	Percent by Weight
	None	

SECTION X - ADDITIONAL REGULATORY INFORMATION (cont.)

-PROP 65 (CARCINOGEN):
WARNING: This product contains a chemical known to the state of California to cause cancer.

CAS#	Chemical Name
	None

-PROP 65 (TERATOGEN):
WARNING: This product contains a chemical known to the state of California to cause birth defects or other reproductive harm.

CAS#	Chemical Name
	None

-PROP 65 (BOTH CARCINOGEN AND TERATOGEN):
WARNING: This product may contain a chemical known to the state of California to cause cancer or birth defects or other reproductive harm

CAS#	Chemical Name
	None

ITEM #1

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

ID. 647

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME: BY*PAS INTERNATIONAL CORPORATION	EMERGENCY TELEPHONE NO.: 616 875-7234
ADDRESS (Number, Street, City, State, and ZIP Code): 6350.76th Avenue . Zeeland. Michigan 49464	
CHEMICAL NAME AND SYNONYMS: BY*PAS DECONTAMINATION CHEMICAL	TRADE NAME AND SYNONYMS: BY*PAS (F) 1000
CHEMICAL FAMILY: CLEANER/DEGREASER (ALKALINE)	FORMULA: PROPRIETARY

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

NONE

NONE

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
NONE		

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	98° (C)	SPECIFIC GRAVITY (H_2O=1)	1.080
VAPOR PRESSURE (mm Hg.)	UNDET.	PERCENT, VOLATILE BY VOLUME (%)	UNDET.
VAPOR DENSITY (AIR=1)	UNDET.	EVAPORATION RATE (_____ =1)	UNDET.
SOLUBILITY IN WATER	COMPLETELY SOLUBLE		
APPEARANCE AND ODOR	AQUA BLUE LIQUID WITH MILD ODOR		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	NONE	FLAMMABLE LIMITS	Lel / Uel
EXTINGUISHING MEDIA	NONE		
SPECIAL FIRE FIGHTING PROCEDURES	NONE		
UNUSUAL FIRE AND EXPLOSION HAZARDS	NONE		

(Continued on reverse side)

F-10.11

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	NOT DETERMINED
EFFECTS OF OVEREXPOSURE	DRYING TO SKIN
	IRRITATING TO EYES
EMERGENCY AND FIRST AID PROCEDURES	
	FLUSH WITH WATER

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	NONE KNOWN
INCOMPATABILITY *(Materials to avoid)*	NONE KNOWN		
HAZARDOUS DECOMPOSITION PRODUCTS	NONE KNOWN		
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
FLUSH WITH WATER
WASTE DISPOSAL METHOD
LOCAL SEWER

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*			
VENTILATION	LOCAL EXHAUST	ACCEPTABLE	SPECIAL
	MECHANICAL *(General)*		OTHER
PROTECTIVE GLOVES	NOT NEEDED	EYE PROTECTION	NORMAL SAFETY GLASSES
OTHER PROTECTIVE EQUIPMENT	NONE		

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
STORE UNDER 140° (F) KEEP FROM FREEZING.
OTHER PRECAUTIONS

E-10.11

ITEM #2

MATERIAL SAFETY DATA SHEET

SECTION I

PRODUCT NAME OR NUMBER BY*PAS (F) 1000		
MANUFACTURER'S NAME BY*PAS INTERNATIONAL CORP.		EMERGENCY TELEPHONE NO. (616) 875-7234
ADDRESS (Number, Street, City, State and Zip Code) 6350 76th AVENUE; ZEELAND. MICHIGAN 49464		
HAZARDOUS MATERIALS DESCRIPTION AND PROPER SHIPPING NAME(49 CFR 172.101) NONE	HAZARD CLASS (49 CFR 172.101) NONE	
CHEMICAL FAMILY CLEANER--DEGREASER (ALKALINE)	FORMULA PROPRIETARY	LESS THAN

SECTION II — INGREDIENTS (list all ingredients)	CAS. NO.	%
ALKYL ARYL POLETHER ALCOHOL	9036-19-5	1
PHOSPHATE ESTER - POTTASSIUM SALT FORM	44-R1387	10%
TKPP (TETRAPOTASSIUM PYROPHOSPHATE)	7320-34-5	10%
SODIUM MATASILCATE. ANHYDROUS	6834-92-0	20%
DOW - DPM (DIPROPYLENE GLYCOL METHYL ETHER)	22345	10%
H_2O (WATER)	Less than 100%. more than	40%
PHYSICAL DATA ON INDIVIDUAL		
INGREDIENTS AVAILABLE UPON REQUEST.		

PERCENTAGES SHOWN ABOVE ARE ONLY "BALL-PARK" PERCENTAGES, BECAUSE BY*PAS IS A PROPRIETARY FORMULA, EXACT PERCENTAGES CANNOT BE GIVEN.

MSDS-18 6/85

MATERIAL SAFETY DATA SHEET

ORGANIC ORANGE

CTION I - IDENTIFICATION

MPANY NAME.....	O'Neill Industries, Inc. 5101 Comly St. Phila., Pa. 19135
ONE NUMBER.....	(215) 333-5700
ERGENCY PHONE NUMBER...	800-255-3924
FECTIVE DATE.....	4/1/89
VISED DATE.....	3/31/94
EMICAL NAME.....	Orange Distillate
ADE NAME.....	ORGANIC ORANGE

CTION II - INGREDIENTS

MPONENTS	PERCENT	TLV (Units)	PROD. CAS #
8(9)-p-Methadiene	>95%	Not established	5989-27-5
nylphenoxy- yethoxyethanol	<5%	Not established	26027-38-3

CTION III - PHYSICAL DATA

LING Point(F).....	175.5° C
LUBILITY IN H20.....	Emulsifiable
EAR CE/ODOR.....	Clear colorless liquid, citrus odor
CIFIC GRAVITY (H20=1).	.85
.....	

CTION IV - FIRE AND EXPLOSION HAZARD DATA

SH POINT.....	115° F Closed Cup
INGUISH MEDIA.....	Use foam, dry chemical, or CO_2
FIRE.....	Minimize breathing vapor or fumes. Cool fire exposed containers. Do not enter confined fire-spaces without proper protective clothing, including self contained air supply.
SUAL FIRE HAZARD.....	Burning liberates carbon monoxide, carbon dioxide and smoke.

CTION V - HEALTH HAZARD DATA

R EXPOSURE EFFECTS....	Liquid may be irritating to eyes and skin. Vapor is irritating to throat and lungs.
ST AID PROCEDURES.....	EYES; Immediately flush eyes with water for at least 15 minutes. Seek medical attention immediately. SKIN; Wash with water. If irritation develops or persists seek medical attention. INHALATION; Remove to fresh air. INGESTION: DO NOT INDUCE VOMITING. Give large quantities of water. Get medical attention immediately.

TIO VI - REACTIVITY DATA

MICAL STABILITY.....	Stable

MATERIAL SAFETY DATA SHEET

ORGANIC ORANGE

CONDITIONS TO AVOID..... Excessive heat and flames. Avoid strong oxidizing agents.
INCOMPATIBLE MATERIALS... Strong acids, strong oxidizers
DECOMPOSITION PRODUCTS... Carbon dioxide, carbon monoxide
HAZARDOUS POLYMERIZATION. Will not occur
POLYMERIZATION AVOID.....

SECTION VII - SPILL OR LEAK PROCEDURE

FOR SPILL ..... Absorb with inert material and dispose of in accordance with applicable regulations.
WASTE DISPOSAL METHOD.... Dispose of according to all local, state, and federal regulations.

SECTION VIII - SPECIAL PROTECTION

RESPIRATORY PROTECTION... None needed under normal conditions
VENTILATION..... Local
PROTECTIVE GLOVES..... Rubber
EYE PROTECTION..... Chemical goggles
OTHER PROTECTIVE EQUIPMENT.....
HANDLING AND STORAGE..... STORE IN A COOL, DRY, WELL VENTILATED AREA.
KEEP CONTAINER CLOSED WHEN NOT IN USE.
KEEP AWAY FROM HEAT AND FLAMES.
USE WITH ADEQUATE VENTILATION.
KEEP OUT OF REACH OF CHILDREN.
WEAR SAFETY GOGGLES AND RUBBER GLOVES WHEN HANDLING THIS PRODUCT.

SECTION IX - SPECIAL PRECAUTIONS

DOT SHIPPING NAME..... Combustible liquid, n.o.s., NA 1993, PG III
DOT LABEL REQUIRED..... None required
REPORTABLE QUANTITY (RQ). N/A
NA NUMBER..... NA 1993
UN NUMBER..... N/A

COMMENTS The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them to assure proper use of these materials and the safety and health of employees.

MATERIAL SAFETY DATA SHEET

(Essentially Similar to Form OSHA-20)

J.D. # E-10.8
✓ Idrnt. C 44

SECTION I

NAME	MSA CLEANER-SANITIZER II		
CTURER	Mine Safety Appliances Company 600 Penn Center Boulevard Pittsburgh, PA 15235	FORMULA CODE	8599-03
		COMPLETED BY	L. P. Dewosky
		TITLE	Mgr. Product Safety
NCY PHONE NO.	412-273-5500	DATE	3-17-81

SECTION II - INGREDIENTS

	CAS NUMBER	WEIGHT, %
ACTIVE INGREDIENTS:		54.7
SODIUM CARBONATE	497-19-8	42.2
TRISODIUM PHOSPHATE	7601-54-9	10.0
ALKYL (C14, 50%; C12, 40%; C16, 10%) DIMETHYL BENZYL AMMONIUM CHLORIDES	139-08-2	2.5
INERT INGREDIENTS:		45.3
SODIUM TRIPOLYPHOSPHATE	7758-29-4	
SODIUM BICARBONATE	144-55-8	
WATER	7732-18-5	
ISOMERIC LINEAR ALCOHOLS (C11-C15) POLYETHOXY ETHANOLS	68131-40-8*	
ETHANOL	64-17-5	
ISOBORNYL ACETATE	125-12-2	

SECTION III - PHYSICAL DATA

S POINT (° F.)	NA	SPECIFIC GRAVITY (H_2O=1)	0.8
PRESSURE (mm Hg.)	NA	%VOLATILE BY VOLUME	NA
DENSITY (AIR=1)	NA	EVAPORATION RATE (_____=1)	NA
LITY IN WATER	20%	pH 1% AQUEOUS SOLUTION	9.5 - 10.5
RANCE DOR	FRAGRANT BLEND OF WHITE POWDERS		

SECTION IV - FIRE AND EXPLOSION DATA

POINT (Method used)	NO FLASH TO 240 F	FLAMMABLE LIMITS	Lel NA	Uel NA	
UISHING MEDIA	WATER SPRAY (FOG), FOAM, DRY CHEMICAL, CARBON DIOXIDE				
L FIRE NG PROCEDURES	BLANKET FIRE WITH EXTINGUISHING MEDIUM				
AL FIRE AND ION HAZARDS	PRODUCT IS NONREACTIVE AND DOES NOT READILY SUPPORT COMBUSTION				

Ddent-61

SECTION V - HEALTH HAZARD DATA

SKIN CONTACT WITH POWDER MAY CAUSE BURNS. FLUSH AFFECTED AREA WIT CLEAN WATER.
EYE CONTACT WITH POWDER MAY CAUSE CORNEAL BURNS. AVOID RUBBING EYES BECAUSE WATER INSOLUBLE PARTICLES MAY SCRATCH CORNEA. IMMEDIATELY FLUSH EYES WITH CLEAN WATER WHILE HOLDING EYELIDS APART. CONTINUE FLUSHING FOR AT LEAST 15 MINUTES OR UNTIL IRRITATION SUBSIDES. CONSULT PHYSICIAN AS SOON AS POSSIBLE.
INHALATION OF A LARGE ENOUGH QUANTITY TO POSE A SIGNIFICANT HEALTH HAZARD IS IMPROBABLE.
INGESTION OF POWDER IS HARMFUL OR FATAL. SHOULD INGESTION OCCUR, DRINK MILK, RAW EGG WHITE, OR GELATIN SOLUTION, OR LARGE QUANTITIES OF WATER. AVOID ALCOHOL. CONSULT PHYSICIAN AS SOON AS POSSIBLE.

SECTION VI - REACTIVITY DATA

TABILITY	UNSTABLE		CONDITIONS TO AVOID	NONE
	STABLE	X		
AZARDOUS OLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID	NONE
	WILL NOT OCCUR	X		
AZARDOUS ECOMPOSITION RODUCTS	UNDETERMINED			
ICOMPATIBILITY IATERIALS TO AVOID)	OXIDIZING AGENTS SOAP AND ANIONIC SURFACTANTS DEACTIVATE GERMICIDE			

SECTION VII - SPILL OR LEAK PROCEDURES

TEPS TO BE TAKEN I CASE MATERIAL RELEASED OR SPILLED	SWEEP UP
ASTE DISPOSAL ETHOD	REMOVE TO SANITARY LANDFILL AWAY FROM WATER SUPPLIES DESTROY EMPTY CONTAINERS

SECTION VIII - SPECIAL PROTECTION INFORMATION

PECIAL ESPIRATORY ROTECTION	NOT REQUIRED
PECIAL KIN ROTECTION	NOT REQUIRED
PECIAL YE ROTECTION	NOT REQUIRED

SECTION IX - SPECIAL PRECAUTIONS

PECIAL ANDLING RECAUTIONS	NOT REQUIRED
PECIAL TORAGE RECAUTIONS	NOT REQUIRED. MINIMUM SHELF LIFE 6 MONTHS. FOR MAXIMUM SHELF LIFE AVOID HIGH HUMIDITY AND STORE IN A CLEAN, DRY PLACE.
THER PECIAL	NOT REQUIRED

CROMPTON & KNOWLES CORPORATION
DYES & CHEMICALS DIVISION
ENVIRONMENTAL AFFAIRS DEPARTMENT
P.O. BOX 341
READING, PA 19603

(215) 582-8765

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

TRADE NAME.....: INTRACID RHODAMINE WT LIQUID
CHEMICAL FAMILY....: XANTHENE
ITEM FAMILY.....: 4517
COLOR INDEX NAME...: C.I.ACID RED 388
REVISION DATE.....: 01/03/89 LAST REVISION DATE: 06/03/85

II. HAZARD WARNING LABEL

WARNING:

MAY CAUSE EYE IRRITATION

HANDLE WITH CARE. AVOID CONTACT

THIS PRODUCT IS NOT HAZARDOUS AS DEFINED BY THE OSHA HAZARD COMMUNICATION STANDARD. HOWEVER, AS WITH ALL CHEMICALS: HANDLE WITH CARE. AVOID EYE AND SKIN CONTACT. AVOID INHALATION OF DUSTS OR VAPORS. WASH THOROUGHLY AFTER HANDLING. KEEP CONTAINERS CLOSED.

III. HAZARDOUS INGREDIENTS

INGREDIENT: SODIUM HYDROXIDE (1310-73-2) NaOH %: <1
EXPOSURE LIMITS....: 2 MG/M3 CEILING (ACGIH)

HAPIM HMIS
H: 1 F: 1 R: 1 P: C

IV. PHYSICAL DATA

APPEARANCE.....: DARK RED LIQUID
ODOR.....: NO ODOR
BOILING POINT.....: AQUEOUS
MELTING POINT.....: -10 C
PH.....: 10.8 +/- 0.7
SOLUBILITY IN WATER: SOLUBLE
SPECIFIC GRAVITY...: 1.19

V. FIRE AND EXPLOSION DATA

FLASH POINT.....: N/A AQUEOUS
FLAMMABLE LIMITS....: N/A
EXTINGUISHING MEDIA: WATER, DRY CHEMICAL, CO2
SPECIAL PROCEDURES
FOR FIGHTING FIRE..: WEAR SCBA
UNUSUAL HAZARDS....: NONE EXPECTED

NFPA CODE:
F: 1 H: 1 R: 1 S: N

..o REACTIVITY DATA

STABILITY.....: STABLE
CONDITIONS TO
AVOID.....: NONE
POLYMERIZATION.....: WILL NOT OCCUR
CONDITIONS TO
AVOID.....: NONE
INCOMPATIBILITY.....: NONE KNOWN
HAZARDOUS
DECOMPOSITION.....: NOT DETERMINED

VII. HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:
LIQUID IN CONTACT WITH EYES MAY CAUSE IRRITATION.

INTRACID RHODAMINE WT LIQUID WAS TESTED IN A BATTERY OF IN VITRO AND IN VIVO MAMMALIAN ASSAYS RESULTING IN NEGLIGIBLE OR LOW LEVELS OF GENOTOXIC ACTIVITY EVEN AT VERY HIGH CONCENTRATIONS. NO EVIDENCE OF IN VIVO GENETIC ACTIVITY WAS OBSERVED EITHER IN TERMS OF BONE MARROW MICRONUCLEI OR SPERM ABNORMALITIES. (G.R.DOUGLAS ET AL. "COMPARATIVE MAMMALIAN IN VITRO AND IN VIVO STUDIES ON THE MUTAGENIC ACTIVITY OF RHODAMINE WT". MUTATION RESEARCH. 118, 1983. 117-125)

INTRACID RHODAMINE WT WAS POSITIVE IN A SALMONELLA/MAMMALIAN MICROSOME ASSAY (NESTMANN AND KOWBEL, 1979). G.DOUGLAS AS REFERENCED. STATED THAT IMPURITIES IN THE DYE MAY HAVE CAUSED THE MUTAGENIC EFFECTS SEEN OR ALTERNATIVELY THE DYE MAY BE A POINT MUTAGEN. DOUGLAS FURTHER REPORTED THAT TAKING THE DATA ALTOGETHER FROM HIS STUDY. "...RHODAMINE WT APPEARS NOT TO REPRESENT A MAJOR GENOTOXIC HAZARD."

ROUTES OF EXPOSURE:
INHALATION: SKIN: X INGESTION: EYES: X

SIGNS AND SYMPTONS
OF OVEREXPOSURE.....: NOT KNOWN

MEDICAL CONDITIONS
GENERALLY AGGRAVATED
BY EXPOSURE.....: NOT KNOWN

CARCINOGENICITY:
NTP: NO IARC: NO OSHA REGULATED: NO :

TOXICITY DATA:
ORAL (ANIMAL).....: ALD 25 G/KG
DERMAL (ANIMAL).....: NO DATA
INHALATION (ANIMAL): NO DATA
EFFECTS TO EYES
(ANIMAL).....: NO DATA
SKIN IRRITATION.....:
(ANIMAL).....: NO DATA
FISH, LC50 (LETHAL): >320 MG/L 96HR
ADDITIONAL DATA.....: SEE OVEREXPOSURE ABOVE

VIII. EMERGENCY AND FIRST AID PROCEDURE

INHALATION.....: IF INHALED, MOVE TO FRESH AIR. IF BREATHING IS

DIFFICULT. GIVE OXYGEN AND GET MEDICAL ATTENTION RIGHT AWAY.

EYE CONTACT.....: FLUSH EYES WITH FLOWING WATER FOR AT LEAST 15 MINUTES, HOLDING EYELIDS APART TO IRRIGATE THOROUGHLY. GET MEDICAL ATTENTION RIGHT AWAY.

SKIN CONTACT.....: WASH AFFECTED SKIN AREAS THOROUGHLY WITH SOAP AND WATER. IF IRRITATION DEVELOPS, CONSULT A PHYSICIAN

INGESTION.....: IF SWALLOWED, DILUTE WITH WATER AND INDUCE VOMITING. GET IMMEDIATE MEDICAL ATTENTION. NEVER GIVE FLUIDS OR INDUCE VOMITING IF PATIENT IS UNCONSCIOUS OR HAS CONVULSIONS.

IX. SPECIAL PROTECTION

RESPIRATORY.....: NOT REQUIRED
EXPOSURE LIMITS....: NONE ESTABLISHED FOR THE LIQUID PRODUCT

VENTILATION LOCAL: X MECHANICAL:

PROTECTIVE GLOVES..: RUBBER GLOVES
EYE PROTECTION.....: GOGGLES
OTHER PROTECTIVE EQUIPMENT.....: APRON, COVERALL TO MINIMIZE SKIN CONTACT

X. SPECIAL PRECAUTIONS

IN ACCORD WITH GOOD INDUSTRIAL PRACTICE, HANDLE THIS PRODUCT WITH CARE AND AVOID PERSONAL CONTACT.

XI. TRANSPORTATION INFORMATION

DOT HAZARD CLASSIFICATION.....: N/A
DOT PROPER SHIPPING NAME.....: DOT NOT REGULATED
DOT LABEL.....: N/A
UN/NA NUMBER.....: N/A
R.Q.....: N/A

XII. SPILL AND LEAK PROCEDURES

REGULATORY WASTE DESCRIPTION.....: NOT HAZARDOUS ACCORDING TO 40 CFR PART 261
R.Q.....: NONE
WASTE DISPOSAL.....: BURY OR INCINERATE ACCORDING TO FEDERAL, STATE AND LOCAL REGULATIONS.
DRUM DISPOSAL.....: CONTAINERS SHOULD BE TRIPLE RINSED ACCORDING TO FEDERAL REGULATIONS.

STEPS TO BE TAKEN IF MATERIAL RELEASED OR SPILLED.....: WEAR APPROPRIATE SAFETY EQUIPMENT. CONTAIN AND CLEAN UP SPILL IMMEDIATELY. PREVENT FROM ENTERING FLOOR DRAINS. CONTAIN LIQUIDS USING ABSORBANTS. SWEEP POWDERS CAREFULLY MINIMIZING DUSTING. SHOVEL ALL SPILL MATERIALS INTO DISPOSAL DRUM. FOLLOW DISPOSAL INSTRUCTIONS. SCRUB SPILL AREA WITH DETERGENT, FLUSH WITH COPIOUS AMOUNTS OF WATER.

XIII. REGULATORY INFORMATION

CA.....: IN COMPLIANCE.

SARA:
THIS PRODUCT IS NOT REPORTABLE UNDER SARA SECTION 313

HMA HAZARD CLASSIFICATION:
ACUTE....: NO CHRONIC...: NO FLAMMABLE.:NO
REACTIVE.: NO OXIDIZER.: NO

STATE RIGHT TO KNOW LAWS:
PENNSYLVANIA
THIS PRODUCT IS NOT REGULATED UNDER THE PENNA R-T-K LAW
NONHAZARDOUS INGREDIENTS:
C.I.ACID RED 388
WATER

XIV. OTHER INFORMATION

THIS PRODUCT IS NOT A "CONTROLLED" PRODUCT AS DEFINED BY THE CANADIAN WHMIS.

DISCLAIMER:

CROMPTON & KNOWLES WARRANTS THAT THIS PRODUCT CONFORMS TO THE CHEMICAL DESCRIPTION ON THE LABEL AND IS REASONABLY FIT FOR THE SPECIFIC PURPOSES REFERRED TO IN ITS DIRECTIONS FOR USE. SUBJECT TO THE INHERENT RISKS REFERRED TO IN THE MATERIAL SAFETY DATA SHEET FOR THIS PRODUCT. CROMPTON & KNOWLES MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILTIY OR ANY OTHER EXPRESS OR IMPLIED WARRANTY. IN NO CASE SHALL CROMPTON & KNOWLES BE LIABLE FOR CONSEQUENTIAL. SPECIAL. OR INDIRECT DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT.

INTRACID®
Rhodamine WT Liquid

Technical Data Bulletin

IPD NO. 022

JULY 1988

GENERAL

Intracid Rhodamine WT Liquid is a bright fluorescent red dye developed especially for water tracing. It exhibits exceptionally high tinctorial strength and a low tendency to stain silt, dirt, organic (plants) and other suspended matter in fresh and salt waters. It is designed for water tracing by fluorometry or visual methods and is detectable at 0.1 ppb by fluorometric techniques. A manufacturer of fluorometers such as Turner Designs* should be consulted for detailed application information. For precise scientific work, the user should carry out his own measurements on the starting material since there will be some variation from lot to lot.

According to studies by the U.S. Army Corps of Engineers, **Intracid Rhodamine WT Liquid** poses no known environmental or health hazards when used in compliance with established dye concentrations.

The suitability of this product for specific water tracing applications should be evaluated by qualified hydrologists.

PROPERTIES

Appearance	Clear, very dark red aqueous solution, substantially free from insoluble matter.
Specific gravity	Approximately 1.15 at 20/20°C. Gravity on specific lots will be provided on request.
pH	10.8 ± 0.7 at 20°C.
Dispersion in sea water	Shows complete dispersion when dropped into sea water.
Bleachability	Bleachable with sodium hypochlorite.
Optimum Excitation Wavelength	About 556 nm.
Optimum Analyzing Wavelength	About 580 nm.
pH sensitivity	No significant change in fluorescence between 5.5 and 11.0.
Freezing point	Approximately -10°C.
Viscosity	Less than 25 centipoises at 25°C.

*Turner Designs, Mountain View, CA 94043 . 415/965-9800

Crompton & Knowles Corporation
Industrial Products Division
P. O. Box 33157 Charlotte, NC 28233-3157 ■ 704/372-5890 ■ 800/323-4383


Crompton
& Knowles
is Your Dye
and Chemical
Resource
Company

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF WATER

AUG 2 1988

RECEIVED

Ms. Janice Warnquist
Chemical Safety Manager
Crompton and Knowles Corporation
P.O. Box 341 (500 Pear Street)
Reading, Pennsylvania 19603

Dear Ms. Warnquist:

The Criteria and Standards Division (Office of Drinking Water) has reviewed the available data on chemistry and toxicity of Rhodamine dyes. We would not anticipate any adverse health effects resulting from the use of Rhodamine WT as a fluorescent tracer in water flow studies when used with the following guidelines.

- A maximum concentration of 100 micrograms/liter Rhodamine WT is recommended for addition to raw water in hydrological studies involving surface and ground waters.

- Dye concentration should be limited to 10 micro-micrograms/liter in raw water when used as a tracer in or around drinking water intakes.

- Concentration in drinking water should not exceed 0.1 micrograms/liter. Studies which result in actual human exposure to the dye via drinking water must be brief and infrequent. This level is not acceptable for chronic human exposure.

- In all of the above cases, the actual concentration used should not exceed the amount required for reasonably certain detection of the dye as required to accomplish the intended purpose of the study.

The Criteria and Standards Division recommends that Rhodamine B not be used as a tracer dye in water flow studies.

This advisory supersedes all earlier advisories issued by EPA on the use of fluorescent dyes as tracers in water flow studies. This advisory is granted on a temporary basis only.

EPA is terminating its voluntary additives advisory program as announced in the Federal Register (53 FR, 25586, July 7, 1988). A copy of the Federal Register Notice is enclosed for your convenience. All EPA advisory opinions issued within the framework of the additives program will expire on April 7, 1990.

Our opinion concerning the safety of this tracer dye does not constitute an endorsement, nor does it relate to its effectiveness for the intended use. If this letter is to be used in any way, we require it to be quoted in its entirety.

Sincerely,

Arthur H. Perler, Chief
Science and Technology Branch
Criteria and Standards Division

Enclosure

TOXICOLOGY

(1)	ABIDI, S.L.	DETECTION OF DIETHYLNITROSAMINE IN NITRITE-RICH WATER FOLLOWING TREATMENT WITH RHODAMINE FLOW TRACERS. 1982
(2)	ABIDI, S.L. et al	POTENTIAL FOR NITROSAMINE FORMATION IN SEVEN FISHERY CHEMICALS. 1986
(3)	ABIDI, S.L.	LETTER REFERENCING 1982 ABIDI STUDY. 1987
(4)	BENOIT-GUYOD, J.L. et al	CORRELATIONS BETWEEN PHYSICOCHEMICAL PROPERTIES AND ECOTOXICITY OF FLUORESCENT XANTHENIC WATER TRACERS (IN FRENCH). 1979
(5)	DOUGLAS, G. et al	COMPARATIVE MAMMALIAN IN VITRO AND IN VIVO STUDIES ON THE MUTAGENIC ACTIVITY OF RHODAMINE WT. 1983
(6)	EPA - OFFICE OF WATER	GUIDANCE MANUAL FOR COMPLIANCE WITH THE FILTRATION AND DISINFECTION REQUIREMENTS FOR PUBLIC WATER SYSTEMS USING SURFACE WATER SOURCES. DRAFT, OCTOBER 1987
(7)	EPA - A.H.PERLER	LETTER TO J.WARNQUIST, SETTING MAXIMUM DYE CONCENTRATIONS. 1988
(8)	JOHNSON, M.C. (US ARMY ENGRS)	FLUOROMETRIC TECHNIQUES FOR TRACING RESERVOIR INFLOWS, p.6-10. 1984
(9)	MEIER, P.G. et al	APPLICATION OF TRACER TECHNIQUES TO CONTINUOUS-FLOW TOXICITY TESTING. 1987
(10)	NESTMANN, E. et al	MUTAGENICITY IN SALMONELLA OF RHODAMINE WT, A DYE USED IN WATER TRACING STUDIES. 1979
(11)	PARKER, GARALD	TESTS OF RHODAMINE WT DYE FOR TOXICITY TO OYSTERS AND FISH. 1973
(12)	SMART, P.L.	A REVIEW OF THE TOXICITY OF TWELVE FLUORESCENT DYES USED FOR WATER TRACING. 1984
(13)	SRI INTERNATIONAL	HEALTH AND ENVIRONMENTAL ASPECTS OF RHODAMINE-BASED DYES. 1983
(14)	STEINHEIMER, T. & JOHNSON, S.	INVESTIGATION OF THE POSSIBLE FORMATION OF DIETHYLNITROSAMINE RESULTING FROM THE USE OF RHODAMINE WT DYE AS A TRACER IN RIVER WATERS. 1984

RHODAMINE WT - TITLES AVAILABLE

APPLICATIONS

(15) ALDOUS, P.J. & SMART, P.L. — TRACING GROUND-WATER MOVEMENT IN ABANDONED COAL MINED AQUIFERS USING FLUORESCENT DYES. 1988

(30) BENCALA, K. et al — RHODAMINE WT LOSSES IN A MOUNTAIN STREAM ENVIRONMENT. 1983

(16) DUPONT BULLETIN — DYES FOR WATER TRACING STUDIES. 1969 OR LATER?

(17) GRASSO, D. & WILLIAMS, R. — FLUORESCENT DYE AIDS DISTRIBUTION STUDIES. 1983

(18) JOHNSON, M.C. (US ARMY ENGRS) — FLUOROMETRIC TECHNIQUES FOR TRACING RESERVOIR INFLOWS. 1984

(19) KILPATRICK, F.A. — DOSAGE REQUIREMENTS FOR SLUG INJECTIONS OF RHODAMINE BA AND WT DYES. 1970

(21) NEUDERFER, GARY N. — PLAN FOR RHODAMINE WT DYE STUDIES IN CATHARINE CREEK AND CAYUGA INLET AS PART OF SEA LAMPREY CONTROL PROJECTS IN SENECA AND CAYUGA LAKES. 1983

(22) SMART, P.L. AND LAIDLAW, I.M.S. — AN EVALUATION OF SOME FLUORESCENT DYES FOR WATER TRACING. 1977

TURNER DESIGN, "FLUOROMETRIC FACTS" SERIES:

(23A) CIRCULATION, DISPERSION, AND PLUME STUDIES. 1984(?)

(23B) FLOW MEASUREMENTS IN SANITARY SEWERS BY DYE DILUTION. 1980(?)

(23C) FLOW MEASUREMENTS. 1984(?)

(23D) FLUORESCEIN. 1983

(23E) FLUORESCENT TRACER DYES. 1981

(23F) FLUOROMETRY IN THE WATER POLLUTION CONTROL PLANT. 1982

TURNER DESIGN, OTHER PUBLICATIONS:

(24A) FIELD FLUOROMETRY

(24B) MEASURING WASTEWATER FLOW WITH DYE, 1978

APPLICATIONS, contd.

US DEPT. INTERIOR Techniques of Water Resources Investigations of the U.S. Geological Survey. Book 3, "Applications of Hydraulics"

(25C) Chapter A9: Measurement of time of travel and dispersion by dye tracing. 1982

(25D) Chapter A12: Fluorometric Procedures for Dye Tracing. 1986

BIBIOGRAPHIES AND REFERENCE LISTS

(27) PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS (Manuals published by the U.S. Geological Survey)

(28) REFERENCES CITED IN STEINHEIMER/JOHNSON REPORT ON THE "INVESTIGATION OF THE POSSIBLE FORMATION OF DIETHYLNITROSAMINE RESULTING FROM THE USE OF RHODAMINE WT DYE AS A TRACER IN RIVER WATERS" (SEE TOXICITY) pp. 48 & 49 of Ref.(14).

(29) WATER TRACING WITH FLUORESCENT DYES, PART 1: FIELD EXPERIMENTS IN INTERGRANULAR FLOW AQUIFERS, An Annotated Bibliography. P.L.Smart and F. Whitaker, Dept. of Geography, University of Bristol, 1987

C&K DOCUMENTS

(31) C&K: IPD TECHNICAL DATA BULLETIN NO. 022, 12/86

INTRACID®
Rhodamine WT Liquid

Crompton & Knowles Corporation
Industrial Products Division
P. O. Box 33157
Charlotte, North Carolina 28233-3157
704/372-5890 . 800/323-4383

...Bright red fluorescent water tracing dye and other specialty dyes

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
The Chloramone Corporation	302-834-4558

ADDRESS (Number, Street, City, State, and ZIP Code): River Road & Red Lion Creek, P.O. Box 294, Delaware City, Del. 19706

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
Sodium Hypochlorite Solution 12.5%	15% Bleach

CHEMICAL FAMILY

FORMULA: $Cl_2 + 2\ NaOH = NaOCl + NaCl + H_2O$

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
[illegible]RS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES		%	TLV (Units)
NaOCl	by weight	12.5	
H_2O	by weight	87.5	

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	decomposes	SPECIFIC GRAVITY (H_2O=1) 60° F	1.210
VAPOR PRESSURE (mm Hg.)	N A	PERCENT, VOLATILE BY VOLUME (%)	N A
VAPOR DENSITY (AIR=1)	N A	EVAPORATION RATE (_____ =1)	
SOLUBILITY IN WATER	completely		
APPEARANCE AND ODOR	Pale yellow liquid	chlorine odor	

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
none	non-flammable		

EXTINGUISHING MEDIA: fog nozzle water

SPECIAL FIRE FIGHTING PROCEDURES

[illegible]lf contained gas mask suitable for chlorine gas

UNUSUAL FIRE AND EXPLOSION HAZARDS: none

(Continued on reverse side)

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	Not available
EFFECTS OF OVEREXPOSURE	Not normally dangerous - May cause skin burns irritation to mucus membranes
EMERGENCY AND FIRST AID PROCEDURES	Call physician. Skin burns or eye contact wash with plenty of water.

Internal use: milk - egg whites - antacid liquids (Malox etc.)

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE	X	CONDITIONS TO AVOID
	STABLE		

INCOMPATABILITY *(Materials to avoid)* acids oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID reacts vigourously with oxidizing agents.
	WILL NOT OCCUR		Avoid contact with acids. Chlorine gas may be emitted

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Use fog nozzle water on spillage.

Also flush area with mild soda ash solution. Chlorine fumes will dissapate in atmosphere.

WASTE DISPOSAL METHOD Same as above

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)* Self contained gas mask in area of high concentration

VENTILATION	LOCAL EXHAUST	X	SPECIAL
	MECHANICAL *(General)*		OTHER

PROTECTIVE GLOVES Rubber	EYE PROTECTION Goggles or face shield

OTHER PROTECTIVE EQUIPMENT Rubber shoes - boots - cotton clothing

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING Store in cool dark area away from acids - organics - excessive heat.

OTHER PRECAUTIONS

GPO 934-110

I.D.# C-10.467
Ident 522

SPARTAN CHEMICAL CO., INC.
MATERIAL SAFETY DATA SHEET

SECTION I
PRODUCT IDENTIFICATION

PRODUCT NAME OR NUMBER (as it appears on label)
SD-20 (BULK)

MANUFACTURER'S NAME
Spartan Chemical Co., Inc.

EMERGENCY TELEPHONE NO.
(419) 531-5551

ADDRESS (NUMBER, STREET, CITY, STATE AND ZIP CODE)
110 N. Westwood Ave., Toledo, OH 43607

MANUFACTURER'S D-U-N-S NO.
00-503-6728

SECTION II
HAZARDOUS INGREDIENTS

CAS REGISTRY NO.	%W	CHEMICAL NAME(S)	- Table Z-1-A - TWA mg/M³	STEL mg/M³	Ceiling mg/M³	CARCINOGEN

NO HAZARDOUS INGREDIENTS AT 1% OR GREATER CONCENTRATION

SECTION III
PHYSICAL DATA

BOILING POINT
212 °F ___ °C

SPECIFIC GRAVITY (H_2O = 1)
1.074

VAPOR PRESSURE - 18
@ 75 °F ___ °C X mm Hg ___ psi

PERCENT SOLID BY WEIGHT (%)
15-17

VAPOR DENSITY (AIR = 1)
Unknown

EVAPORATION RATE (but. ace. = 1)
<1

SOLUBILITY IN WATER
Complete

APPEARANCE AND ODOR
Blue, citrus odor

pH
Concentrate 11.0-11.5

IS MATERIAL: (LIQUID) SOLID
GAS PASTE POWDER

SECTION IV
FIRE AND EXPLOSION HAZARD DATA

FLASH POINT - None METHOD USED - ASTM - D92 FLAMMABLE LIMITS - n/a

EXTINGUISHING MEDIA
n/a

SPECIAL FIRE FIGHTING PROCEDURES
n/a

UNUSUAL FIRE AND EXPLOSION HAZARDS
n/a

SECTION V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE - CONDITIONS TO AVOID
Avoid eye contact; may cause eye irritation.

THRESHOLD LIMIT VALUE - Not established

PRIMARY ROUTES OF ENTRY INHALATION ___ SKIN CONTACT ___ OTHER (SPECIFY)

CONDITIONS AGGRAVATED BY USE
Unknown

EMERGENCY AND FIRST AID PROCEDURES - In case of contact immediately flush eyes with plenty of water for at least 15 minutes; call a physician. Flush skin with water. Wash clothing before reuse. If swallowed, give large quantities of water or fruit juice. Call a physician immediately.

SECTION VI - REACTIVITY DATA

STABILITY: UNSTABLE ___
STABLE X
INCOMPATIBILITY (MATERIALS TO AVOID)
None
HAZARDOUS DECOMPOSITION PRODUCTS
None
HAZARDOUS POLYMERIZATION: MAY OCCUR ___
WILL NOT OCCUR X

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Flush with water to sanitary sewer system.

WASTE DISPOSAL METHOD
Same as above.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE)
Nothing special

VENTILATION - Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.

PROTECTIVE GLOVES (SPECIFY TYPE)
If desired

EYE PROTECTION (SPECIFY TYPE)
If desired

OTHER PROTECTIVE EQUIPMENT
n/a

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Nothing special
OTHER PRECAUTIONS
Nothing special

Spartan Chemical Co., Inc.
SD-20 (BULK)
Ref: 29 CFR 1910:1200 (OSHA)

NAME Thomas J. Mitchell
TITLE Director of Research
DATE June 1, 1990
SUPERCEDES September 20, 1985

E-10.4
640

TOUCH IT UP (AEROSOL)
SAM ID# = E-10.4
IDENTIFIER = 640
STATUS APPROVED

SynTech Products Corporation

520 E. Woodruff Avenue
Toledo, Ohio 43624
(419) 241-1215
24 Hour - Call INFOTRAC 1-800-535-5035

Material Safety Data Sheet

Section I - Product Identification

Product Name:	TOUCH IT UP DE-CONTAMINANT
Chemical Family:	
Effective Date:	12-91
Formula:	Prorietary Mixture

Section II - Material or Component

Chemical Name	CAS#	WT%	PEL	TLV	STEL	CARCIG
Butyl Cellosolve	111-76-2	1-3%	50	50		NO
Sodium Metasilicate	6834-92-0	1-3%				NO
Octylphenol Polyehtoxylate	9002-93-1	1-3%				NO
Hydrocarbon Propellant	68476-86-8	6-10%	1000	1000		NO
Trisodium Phosphate	7601-54-9					NO

Section III - Physical Data

Boiling Point (^{o}F) of Concentrate:	N.D.
Vapor Pressure (psig) In Can @ 75^{o}F:	65
Vapor Density:	N.D.
Solubility in Water of Concentration:	Complete
Specific Gravity(H_2O=1)@ 75^{o}F of Concentrate:	1.035
% Volatile by Volume in Can:	85
Flash Point of Spray:	None up to 150^{o}F
Appearance and Odor Spray:	White Foam perfume odor

Section IV - Fire and Explosion Hazard Data

Flammability as per CPSC Flame Extentsion Test:	Non-Flammable
Flammable Limits:	Lower N/A Upper N/A
Extinguishing Media:	Water, Foam, dry chemical, carbon dioxide
Special Fire Fighting Procedures:	Keep containers cool. Use equipment or sheilding required to protect personnel against bursting, rupturing, or venting containers.
Unusual Fire and Explosion Hazards:	At elevated temperatures (above 120^{o}F) containers may vent, rupture, or burst.

Section V - Reactivity Data

Chemical Stability:	Stable
Conditions to Avoid:	Do not expose to temperatures above 120^{o}F.
Incompatibility (Materials to Avoid):	None
Hazardous Decomposition By-Products:	Thermal decomposition in the presence of air may yield Carbon monoxide and/or carbon dioxide.
Hazardous Polymerization:	Will NOT occur.
Conditions to avoid:	None

Section VI - Health Hazard Data

OSHA PERMISSIBLE EXPOSURE LIMIT: N.D.
THRESHOLD LIMIT VALUE: (SEE SECTION II)

EFFECTS TO OVEREXPOSURE

EYES: Minor irritation.
SKIN: No evidence of adverse effect from available information.
INGESTION: Can cause gastrointestinal irritation, nausea, vomiting and diarrhea.
INHALATION: Product exist as foam. Inhalation of foam could cause asphyxiation.

EMERGENCY AND FIRST AID PROCEDURES

EYES: Flush with water for at least 15 minutes.
SKIN: Wash exposed area with water and soap.
INGESTION: Do not induce vomiting. Get medical attention.
INHALATION: Treat for asphyxiation

VII - Spill or Leak Procedures

STEPS TO BE TAKEN IN CASE CONTAINER IS PUNCTURED AND MATERIAL IS RELEASED:
Clean up area by mopping or with absorbent materials and place in closed containers for dispos
Consult Federal, State or Local disposal authorities for approved disposal procedures.
WASTE DISPOSAL METHOD:
When used properly aerosol products do not generate hazardous waste. Empty de-pressurized containers can not be reused and should be wrapped and put in trash collection. Cans which are pressurized or contain liquid must be disposed of in a permitted waste management facili
Consult Federal, State or Local disposal authorities for approved disposal procedures.

Section VIII - Special Protection Information

Specific Personal Protective Equipment

Respiratiory Protection: Under normal conditions, no respiratory protection is required.
Ventilation: Normal ventilation
Skin: None required, protective gloves may be worn.
Eye Protection: None required, chemical splash goggles may be worn.

Section IX - Special Handling Information

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Do not store at temperatures above 120°F.
SPECIAL PRECAUTIONARY STATEMENTS: Please read and follow the directions on the product label, they are your best guide to using this product in the most effective way, and to give the necessary safety precautions to protect your health.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition. We make no warranties, express or implied, and assume no liability in connection with any use of the information.

Prepared by J. Rose

MSDS - Touch It Up

IV. (Continued) N/A

2, 3 Information and Analysis of Effluent Quality for Other Potentially Toxic Pollutants Known or Expected to be Present in the Discharge

(Read instructions carefully and use the tabular format and additional pages, where necessary, to present the required information)

Outfall	Chemical Substance or Compound	Reason for Presence in Discharge	Average Effluent Concentration (µg/l)	Analytical Detection Level (µg/l)

NPDES Permit Number PA 0047325

SECTION C (continued)

IV. (Continued) N/A

4. Any other toxic chemicals known or expected to be present in the discharge.

a. GC/MS "Five Peaks" pollutants (see instructions)

Outfall Number _____

Group Number (3 - 7)	Chemical Substance or Compound Name	Analytical Detection Limit (µg/l)	Average Effluent Concentration (µg/l)	Maximum Effluent Concentration (µg/l)	No. Samples Positive / No. analyzed
					/
					/
					/
					/
					/
					/
					/
					/
					/
					/
					/
					/
					/
					/
					/
					/
					/
					/
					/
					/
					/
					/
					/

Use additional sheets for additional pollutants, and for each Outfall reported.

☐ If additional peaks were not available for one or more groups with the method used check here an attach an explanation of why the method was selected.

NPDES Permit Number PA 0047325

SECTION C (continued)

IV. (Continued) N/A

4.

b. Other Chemicals

Outfall Number _____

Substance	Reason for Presence in Discharge	Average Concentration (µg/l)	Indicate if Presence is Known (K) or Suspected (S)

Provide additional sheets as necessary

SECTION C (continued) NPDES Number PA 0047325

V. HAZARDOUS SUBSTANCE SPILL REPORTING REQUIREMENT EXEMPTION (Optional) N/A
(See Instructions)

1. Name of Table 4 Substance	Outfall	Amount Per Outfall			2. Origin and Source	3. Treatment Provided		
		Quantity lb/24 hrs	Frequency	Duration		a	b	c

SECTION C (continued) NPDES Number PA 0047325

VI. ANTICIPATED ENVIRONMENTAL PROTECTION IMPROVEMENTS OR RELATED CHANGES

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ YES *(complete the following table)* ☒ NO *(go to B)*

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS		3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
	a. No	b. Source of Discharge		a. Required	b. Projected

B. OPTIONAL: You may attach additional sheets describing any additional environmental pollution control programs *(or other production projects)* which may affect your discharges which you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

☐ MARK "X" IF DESCRIPTION OF ADDITIONAL PROGRAMS IS ATTACHED N/A

VII. BIOLOGICAL TOXICITY TEST DATA

Do you know or have reason to believe that any acute or chronic biological toxicity tests were made in the last three (3) years on any of the facility's discharges, or on a receiving water in relation to a discharge?

☐ Yes ☒ No

If yes, attach any information which you have available on the purpose and nature of such testing, and the test results.

All dischargers are encouraged to perform biological toxicity testing. The Department may require biomonitoring testing be conducted after your application is received. The Department may be contacted for protocols.

SECTION D - Stormwater Discharges Associated with Industrial Activity N/A

I. Outfall Location

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. Outfall Number (list)	B. Latitude			C. Longitude			D. Receiving Water (name)

II. Improvements

A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions. ☐ Yes ☐ No

1. Identification of Conditions, Agreements, Etc.	2. Affected Outfalls		3. Brief Description of Project	4. Final Compliance Date	
	number	source of discharge		a. req.	b. proj.

B. You may attach additional sheets describing any additional water pollution (or other environmental projects which may affect your discharges) you now have under way or which you plan. Indicate whether each program is now under way or planned, and indicate your actual or planned schedules for construction.

III. Site Drainage Map

Attach a site map showing topography (or indicating the outline of drainage areas served by the outfall(s) covered in the application if a topographic map is unavailable) depicting the facility including: each of its intake and discharge structures; the drainage area of each storm water outfall; paved areas and buildings within the drainage area of each storm water outfall, each known past or present areas used for outdoor storage or disposal of significant materials, each existing structural control measure to reduce pollutants in storm water runoff, materials loading and access areas, areas where pesticides, herbicides, soil conditioners and fertilizers are applied; each of its hazardous waste treatment, storage or disposal units (including each area not required to have a RCRA permit which is used for accumulating hazardous waste under 40 CFR 262.34); each well where fluids from the facility are injected underground; springs, and other surface water bodies which receive storm water discharges from the facility.

NPDES Number PA 0047325

SECTION E - MISCELLANEOUS INFORMATION SUBMISSION

I. CONTRACTED ANALYTICAL ASSISTANCE

Did a contract laboratory or consulting firm perform any of the analyses required by this application?

☒ Yes, their name(s), address(es) and list(s) of the analyses performed are given below: ☐ No

Name SSM/Laboratories
Address 30 Noble Street
Reading, PA 19611-0527
Phone (610) 376 - 4595

Types of Analyses Performed: Groups 1, 2, 3, 4, 5, 7
Attn: Steve Delp, CIH

Name Teledyne Brown Eng. (Isotopes)
Address 50 Van Buren Avenue
P.O. Box 1235
Westwood, NJ 07675-1235
Phone (201) 664 - 5586

Types of Analyses Performed: Group 8
Attn: Al Hogan

Name PP&L
Address Susquehanna Steam Electric Station
P.O. Box 467
Berwick, PA 18603
Phone (717) 542 - 3996

Types of Analyses Performed: 4C 7C, 12C (Outfall 077)
Attn: Lenny Humpf

SECTION E (continued) NPDES Number PA 0047325

II. OTHER INFORMATION

1. For New Dischargers Only: ☒ Check if Not Applicable

   a. Have there been any technical evaluations performed concerning your anticipated wastewater treatment or control facilities (including engineering reports or pilot plant studies)? Check the appropriate box below.

   ☐ Yes ☐ No

   b. If yes, briefly describe such evaluations and the resulting reports which have been prepared.

   c. Provide the name and location of any existing plant(s) which, to the best of your knowledge, resembles your planned operation with respect to items produced, production processes, wastewater constituents or wastewater treatment.

Name	Location

2. For All Dischargers: (Optional) N/A

   If necessary, use attached sheets to expand upon responses to any of the above Questions, or to call attention to any other information you feel should be considered in establishing permit limitations for the proposed or existing facility.

NPDES Number PA 0047325

SECTION F - CERTIFICATION AND SIGNATURE OF APPLICANT

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

R. G. Byram, Sr. V.P. - Nuclear
Print Name and Title of Person Signing

(610) 774-7502
Telephone Number of Person Signing

Signature of Applicant

7.11.94
Date Application Signed

Sworn and subscribed to before me this
11th day of July, 1994

Jean A. Smolick
Notary Public

NOTARIAL SEAL
Jean A. Smolick, Notary Public
Allentown, Lehigh County
My Commission Expires May 14, 1996

Notary Seal

Please note below the name, address and telephone number of the individual that should be contacted in the event additional information is required: (If same as Item I.C, in Section A, please state).

Name: Jerome S. Fields, REM

Address: Pennsylvania Power & Light Company
Two N. 9th Street, Allentown, PA 18101-1179

Telephone: (610) 774-7889