Permittee: Southwes ı Electric Power Company - Welsh Powe ·ation - Outfall 101

TNRCC Permit Number: 01811-101

TABLE 2 (SHEET 1 OF 2)

DAPHNIA PULEX SURVIVAL

Dates and Times Composite Collected		Date	Time		Date	Time
	FROM:	07/11/99	0730	TO:	07/12/99	0805

Test Initiated: 1615 07/13/99 date

PERCENT SURVIVAL

REP	0%	6%	13%	25%	50%	100%
A	100.0	N/A	N/A	N/A	N/A	100.0
B	100.0	N/A	N/A	N/A	N/A	87.5
C	100.0	N/A	N/A	N/A	N/A	100.0
D	100.0	N/A	N/A	N/A	N/A	100.0
E	100.0	N/A	N/A	N/A	N/A	100.0
Mean	100.0	N/A	N/A	N/A	N/A	97.5

Enter percent effluent corresponding to the LC50 below:

LC50 (*D. pulex*) = N/A % effluent

95% confidence limits: N/A

Method of LC50 calculation: N/A

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WASTEWATER PERMITS
APPLICATIONS TEAM

Prepared by: Bruce Huther Huther & Associates

Permittee: Southwes . Electric Power Company - Welsh Powe :ation - Outfall 101

TNRCC Permit Number: 01811-101

TABLE 2 (SHEET 2 OF 2)

PIMEPHALES PROMELAS SURVIVAL

Dates and Times Composite Collected		Date	Time		Date	Time
	FROM:	07/11/99	0730	TO:	07/12/99	0805

Test Initiated: 1500 07/13/99 date

PERCENT SURVIVAL

REP	0%	6%	13%	25%	50%	100%
A	100.0	N/A	N/A	N/A	N/A	100.0
B	100.0	N/A	N/A	N/A	N/A	100.0
C	100.0	N/A	N/A	N/A	N/A	100.0
D	100.0	N/A	N/A	N/A	N/A	100.0
E	100.0	N/A	N/A	N/A	N/A	100.0
Mean	100.0	N/A	N/A	N/A	N/A	100.0

Enter percent effluent corresponding to the LC50 below:

LC50 (*P. promelas*) = N/A % effluent

95% confidence limits: N/A

Method of LC50 calculation: N/A

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WASTEWATER PERMITS
APPLICATIONS TEAM

Prepared by: Bruce Huther Huther & Associates

FACILITY: Southwestern Electr. ower - Welsh SES - Outfall 101 RMIT #: 01811-101

TABLE 1 (SHEET 1 OF 4)

BIOMONITORING REPORTING FORM

CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION

Dates and Times Composites Collected			DATE	TIME		DATE	TIME
	No. 1	FROM:	10/18/99	0832	TO:	10/18/99	0832
	No. 2	FROM:	10/19/99	0723	TO:	10/20/99	0805
	No. 3	FROM:	10/21/99	0815	TO:	10/22/99	0858

Test initiated: 1415 10/19/99 date

Dilution water used: _____ Receiving water X Synthetic Dilution water

NUMBER OF YOUNG PRODUCED PER FEMALE @ 7 DAYS

	Percent effluent (%)					
REP	0%	7%	9%	12%	16%	21%
A	24	26	25	27	24	26
B	27	29	29	27	28	22
C	25	29	26	25	24	24
D	27	28	24	28	26	28
E	27	26	29	24	27	25
F	26	26	23	26	24	25
G	28	29	28	26	27	24
H	29	30	25	25	26	24
I	25	27	28	23	23	28
J	29	27	27	D-0	27	26
Surviv. Mean	26.7	27.7	26.4	25.7	25.6	25.2
Total Mean	26.7	27.7	26.4	23.1	25.6	25.2
CV%*	6.38	5.40	8.03	6.16	6.69	7.44

* coefficient of variation = standard deviation x 100/mean (calculation based on young of the surviving females)
Designate males (M), and dead females (D-x), along with number of neonates (x) released prior to death.

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WASTEWATER PERMITS
APPLICATIONS TEAM

Prepared by: Jenice Huther Huther & Associates

FACILITY: Southwestern Electric Power - Welsh SES - Outfall 101 PERMIT #: 01811-01

TABLE 1 (SHEET 2 OF 4)

BIOMONITORING REPORTING FORM

CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

1. Dunnett's Procedure or Steel's Many-One Rank Test or Wilcoxon Rank Sum Test (with Bonferroni adjustment) or t-test (with Bonferroni adjustment) as appropriate:

Is the mean number of young produced per female significantly less (p=0.05) than the number of young per female in the control for the % effluent corresponding to (significant nonlethal effects):

a.) LOW FLOW OR CRITICAL DILUTION (16 %) _____ YES ___X___ NO

PERCENT SURVIVAL

	Percent effluent (%)					
Time of Reading	0%	7%	9%	12%	16%	21%
24 hour	100.0	100.0	100.0	100.0	100.0	100.0
48 hour	100.0	100.0	100.0	100.0	100.0	100.0
End of Test	100.0	100.0	100.0	90.0	100.0	100.0
CV%	0.00	0.00	0.00	35.14	0.00	0.00

2. Fisher Exact Test:

Is the mean survival at test end significantly less (p=0.05) than the control survival for the % effluent corresponding to (lethality):

a.) LOW FLOW OR CRITICAL DILUTION (16 %) _____ YES ___X___ NO

3. Enter percent effluent corresponding to each NOEC (no observed effect concentration) below and circle the lowest number:

a.) NOEC Survival = ___21___ % effluent

b.) NOEC Reproduction = ___21___ % effluent

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WASTEWATER PERMITS APPLICATIONS TEAM

Prepared by: _____ Huther & Associates

FACILITY: Southwestern Electri. ower - Welsh SES - Outfall 101 RMIT #: 01811-101

TABLE 1 (SHEET 3 OF 4)

BIOMONITORING REPORTING FORM

PIMEPHALES PROMELAS SURVIVAL AND GROWTH

			DATE	TIME		DATE	TIME
Dates and Times Composites Collected	No. 1	FROM:	10/18/99	0832	TO:	10/18/99	0832
	No. 2	FROM:	10/19/99	0723	TO:	10/20/99	0805
	No. 3	FROM:	10/21/99	0815	TO:	10/22/99	0858

Test initiated: 1520 10/19/99 date

Dilution water used: _____ Receiving water X Synthetic Dilution water

FATHEAD MINNOW GROWTH DATA

Effluent Concentration (%)	Average Dry Weight in milligrams in replicate chambers					Mean Dry Weight	CV%*
	A	B	C	D	E		
0%	0.3620	0.4210	0.4310	0.4410	0.4090	0.4128	7.46
7%	0.3960	0.4520	0.4460	0.4390	0.4520	0.4370	5.39
9%	0.4380	0.4560	0.4260	0.4480	0.4390	0.4414	2.56
12%	0.3970	0.4520	0.4460	0.4160	0.4060	0.4234	5.77
16%	0.4520	0.4460	0.4390	0.4270	0.3820	0.4292	6.52
21%	0.4470	0.3720	0.3980	0.4560	0.4620	0.4270	9.32

* coefficient of variation = standard deviation x 100/mean

1. Dunnett's Procedure or Steel's Many-One Rank Test or Wilcoxon Rank Sum Test (with Bonferroni adjustment) or t-test (with Bonferroni adjustment) as appropriate:

   Is the mean dry weight (growth) at 7 days significantly less (p=0.05) than the control's dry weight (growth) for the % effluent corresponding to (significant nonlethal effects):

   a.) LOW FLOW OR CRITICAL DILUTION (16%) _____ YES X NO

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WASTEWATER PERMITS
APPLICATIONS TEAM

Prepared by: Bruce Huther Huther & Associates

FACILITY: Southwestern Electric Power - Welsh SES - Outfall 101 PERMIT #: 01811-101

TABLE 1 (SHEET 4 OF 4)

BIOMONITORING REPORTING FORM

PIMEPHALES PROMELAS SURVIVAL AND GROWTH

FATHEAD MINNOW SURVIVAL DATA

Effluent Concentration (%)	Percent Survival in Replicate Chambers					Mean Percent Survival			CV%*
	A	B	C	D	E	24h	48h	7 days	
0%	75.0	100.0	100.0	100.0	100.0	100.0	100.0	95.0	11.77
7%	87.5	100.0	100.0	100.0	100.0	100.0	100.0	97.5	5.73
9%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.00
12%	87.5	100.0	100.0	87.5	87.5	100.0	100.0	92.5	7.40
16%	100.0	100.0	100.0	100.0	87.5	100.0	100.0	97.5	5.73
21%	100.0	75.0	87.5	100.0	100.0	100.0	100.0	92.5	12.09

* coefficient of variation = standard deviation x 100/mean

2. Dunnett's Procedure or Steel's Many-One Rank Test or Wilcoxon Rank Sum Test (with Bonferroni adjustment) or t-test (with Bonferroni adjustment) as appropriate:

Is the mean survival at 7 days significantly less (p=0.05) than the control survival for the % effluent corresponding to:

a.) LOW FLOW OR CRITICAL DILUTION (16 %) _____ YES ___X___ NO

3. Enter percent effluent corresponding to each NOEC (no observed effect concentration) below and circle the lowest number:

a.) NOEC Survival = ___21___ % effluent

b.) NOEC Growth = ___21___ % effluent

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WASTEWATER PERMITS
APPLICATIONS TEAM

Prepared by: Huther & Associates

TABLE 2 (Sheet 1 of 2)

Ceriodaphnia dubia Survival

Permittee: Southwestern Electric Power Company - Welsh Power Station

TNRCC No.: 01811-301

Outfall No.: 301

Date Composite Collected				Time Composite Collected			
FROM:	07/11/99	TO:	07/12/99	FROM:	0745	TO:	0755

Test initiated: 1415 07/13/99 date

DATA TABLE FOR *CERIODAPHNIA DUBIA* PERCENT SURVIVAL

TIME	0%	6%	13%	25%	50%	100%
START	100.0	N/A	N/A	N/A	N/A	100.0
24 HOUR	100.0	N/A	N/A	N/A	N/A	100.0
MEAN	100.0	N/A	N/A	N/A	N/A	100.0

Data extracted from chronic test initiated on July 13, 1999

Enter percent effluent corresponding to the LC50 below:

LC50 (*C. dubia*) = N/A % effluent

95% confidence limits: N/A

Method of LC50 calculation: N/A

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WASTEWATER PERMITS
APPLICATIONS TEAM

Prepared by: Huther & Associates

TABLE 2 (Sheet 2 of 2)

Pimephales promelas Survival

Permittee: Southwestern Electric Power Company - Welsh Power Station

TNRCC No.: 01811-301

Outfall No.: 301

Date Composite Collected				Time Composite Collected			
FROM:	07/11/99	TO:	07/12/99	FROM:	0745	TO:	0755

Test initiated: 1445 07/13/99 date

DATA TABLE FOR *PIMEPHALES PROMELAS* PERCENT SURVIVAL

TIME	REP	0%	6%	13%	25%	50%	100%
24H	A	100.0	N/A	N/A	N/A	N/A	100.0
	B	100.0	N/A	N/A	N/A	N/A	100.0
	C	100.0	N/A	N/A	N/A	N/A	100.0
	D	100.0	N/A	N/A	N/A	N/A	100.0
	E	100.0	N/A	N/A	N/A	N/A	100.0
	Mean	100.0	N/A	N/A	N/A	N/A	100.0

Data extracted from chronic test initiated on July 13, 1999

Enter percent effluent corresponding to the LC50 below:

LC50 (*P. promelas*) = N/A % effluent

95% confidence limits: N/A

Method of LC50 calculation: N/A

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WASTEWATER PERMITS
APPLICATIONS TEAM

Prepared by: Bruce Huther Huther & Associates

FACILITY: Southwestern Electr ower - Welsh SES - Outfall 301 RMIT #: 01811-301

TABLE 1 (SHEET 1 OF 4)

BIOMONITORING REPORTING FORM

CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION

Dates and Times Composites Collected			DATE	TIME		DATE	TIME
	No. 1	FROM:	10/17/99	0830	TO:	10/18/99	0815
	No. 2	FROM:	10/19/99	0745	TO:	10/20/99	0823
	No. 3	FROM:	10/21/99	0825	TO:	10/22/99	0845

Test initiated: 1415 10/19/99 date

Dilution water used: _____ Receiving water X Synthetic Dilution water

NUMBER OF YOUNG PRODUCED PER FEMALE @ 7 DAYS

	Percent effluent (%)					
REP	0%	32%	42%	56%	75%	100%
A	27	28	26	26	26	25
B	26	27	26	26	25	27
C	27	27	26	28	27	26
D	27	25	26	26	26	25
E	28	26	27	28	27	27
F	27	27	26	27	27	26
G	27	28	26	27	28	27
H	28	27	26	27	26	26
I	28	25	26	26	27	26
J	27	27	26	27	25	28
Surviv. Mean	27.2	26.7	26.1	26.8	26.4	26.3
Total Mean	27.2	26.7	26.1	26.8	26.4	26.3
CV%*	2.33	3.97	1.21	2.94	3.66	3.61

* coefficient of variation = standard deviation x 100/mean (calculation based on young of the surviving females)
Designate males (M), and dead females (D-x), along with number of neonates (x) released prior to death.

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WASTEWATER PERMITS
APPLICATIONS TEAM

Prepared by: Bruce Huther Huther & Associates

FACILITY: Southwestern Electr ower - Welsh SES - Outfall 301 RMIT #: 01811-301

TABLE 1 (SHEET 2 OF 4)

BIOMONITORING REPORTING FORM

CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION TEST

1. Dunnett's Procedure or Steel's Many-One Rank Test or Wilcoxon Rank Sum Test (with Bonferroni adjustment) or t-test (with Bonferroni adjustment) as appropriate:

Is the mean number of young produced per female significantly less (p=0.05) than the number of young per female in the control for the % effluent corresponding to (significant nonlethal effects):

a.) LOW FLOW OR CRITICAL DILUTION (100 %) _____ YES ___X___ NO

PERCENT SURVIVAL

	Percent effluent (%)					
Time of Reading	0%	32%	42%	56%	75%	100%
24 hour	100.0	100.0	100.0	100.0	100.0	100.0
48 hour	100.0	100.0	100.0	100.0	100.0	100.0
End of Test	100.0	100.0	100.0	100.0	100.0	100.0
CV%	0.00	0.00	0.00	0.00	0.00	0.00

2. Fisher Exact Test:

Is the mean survival at test end significantly less (p=0.05) than the control survival for the % effluent corresponding to (lethality):

a.) LOW FLOW OR CRITICAL DILUTION (100 %) _____ YES ___X___ NO

3. Enter percent effluent corresponding to each NOEC (no observed effect concentration) below and circle the lowest number:

a.) NOEC Survival = ___100___ % effluent

b.) NOEC Reproduction = ___100___ % effluent

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APPLICATIONS TEAM

Prepared by: Bruce Huther Huther & Associates

FACILITY: Southwestern Electri. ower - Welsh SES - Outfall 301 RMIT #: 01811-301

TABLE 1 (SHEET 3 OF 4)

BIOMONITORING REPORTING FORM

PIMEPHALES PROMELAS SURVIVAL AND GROWTH

			DATE	TIME		DATE	TIME
Dates and Times Composites Collected	No. 1	FROM:	10/17/99	0830	TO:	10/18/99	0815
	No. 2	FROM:	10/19/99	0745	TO:	10/20/99	0823
	No. 3	FROM:	10/21/99	0825	TO:	10/22/99	0845

Test initiated: 1545 10/19/99 date

Dilution water used: _____ Receiving water X Synthetic Dilution water

FATHEAD MINNOW GROWTH DATA

Effluent Concentration (%)	Average Dry Weight in milligrams in replicate chambers					Mean Dry Weight	CV%*
	A	B	C	D	E		
0%	0.4260	0.4310	0.4520	0.3980	0.4160	0.4246	4.67
32%	0.4470	0.3650	0.4530	0.4410	0.4370	0.4286	8.41
42%	0.3950	0.4560	0.4490	0.4380	0.4410	0.4358	5.48
56%	0.4290	0.4380	0.4560	0.4490	0.3720	0.4288	7.79
75%	0.4520	0.4270	0.4390	0.3810	0.4460	0.4290	6.62
100%	0.4470	0.4520	0.3950	0.3990	0.4260	0.4238	6.22

* coefficient of variation = standard deviation x 100/mean

1. Dunnett's Procedure or Steel's Many-One Rank Test or Wilcoxon Rank Sum Test (with Bonferroni adjustment) or t-test (with Bonferroni adjustment) as appropriate:

Is the mean dry weight (growth) at 7 days significantly less (p=0.05) than the control's dry weight (growth) for the % effluent corresponding to (significant nonlethal effects):

a.) LOW FLOW OR CRITICAL DILUTION (100%) _____ YES X NO

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WASTEWATER PERMITS
APPLICATIONS TEAM

Prepared by: Huther & Associates

FACILITY: Southwestern Electric Power - Welsh SES - Outfall 301 MIT #: 01811-301

TABLE 1 (SHEET 4 OF 4)

BIOMONITORING REPORTING FORM

PIMEPHALES PROMELAS SURVIVAL AND GROWTH

FATHEAD MINNOW SURVIVAL DATA

Effluent Concentration (%)	Percent Survival in Replicate Chambers					Mean Percent Survival			CV%*
	A	B	C	D	E	24h	48h	7 days	
0%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.00
32%	100.0	75.0	100.0	100.0	100.0	100.0	100.0	95.0	11.77
42%	87.5	100.0	100.0	100.0	100.0	100.0	100.0	97.5	5.73
56%	100.0	100.0	100.0	100.0	87.5	100.0	100.0	97.5	5.73
75%	100.0	100.0	100.0	87.5	100.0	100.0	100.0	97.5	5.73
100%	100.0	100.0	87.5	87.5	87.5	100.0	100.0	92.5	7.40

* coefficient of variation = standard deviation x 100/mean

2. Dunnett's Procedure or Steel's Many-One Rank Test or Wilcoxon Rank Sum Test (with Bonferroni adjustment) or t-test (with Bonferroni adjustment) as appropriate:

Is the mean survival at 7 days significantly less (p=0.05) than the control survival for the % effluent corresponding to:

a.) LOW FLOW OR CRITICAL DILUTION (100 %) _____ YES ___X___ NO

3. Enter percent effluent corresponding to each NOEC (no observed effect concentration) below and circle the lowest number:

a.) NOEC Survival = ___100___ % effluent

b.) NOEC Growth = ___100___ % effluent

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APPLICATIONS TEAM

Prepared by: _____ Huther & Associates

Applicant _____

TNRCC, NPDES, and/or TPDES Permit Number _____

Outfall _____

TABLE D-1 (SHEET 1 OF 2)

DAPHNIA PULEX SURVIVAL

GENERAL INFORMATION

	Time (am/pm)	Date
Composite Sample Collected		
Test Initiated		

PERCENT SURVIVAL

Time	Rep	Percent effluent (%)					
		0%	6%	13%	25%	50%	100%
24h	A						
	B						
	C						
	D						
	E						
	MEAN*						

1. Enter percent effluent corresponding to the LC50 below:

24 hour LC50 (Daphnia or Ceriodaphnia) = _____% effluent
(circle appropriate genus)

95% confidence limits: _____

Method of LC50 calculation: _____

*If 24-hour survivorship data from the chronic Ceriodaphnia dubia test is being used, the mean survival per dilution for all 10 replicates shall be reported on this row.

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Applicant _____

TNRCC, NPDES, and/or TPDES Permit Number _____

Outfall _____

TABLE D-1 (SHEET 2 OF 2)

FATHEAD MINNOW SURVIVAL
(*Pimephales promelas*)

GENERAL INFORMATION

	Time (am/pm)	Date
Composite Sample Collected		
Test Initiated		

PERCENT SURVIVAL

Time	Rep	Percent effluent (%)					
		0%	6%	13%	25%	50%	100%
24h	A						
	B						
	C						
	D						
	E						
	MEAN						

1. Enter percent effluent corresponding to the LC50 below:

24 hour LC50 (*Pimephales*) = _____% effluent

95% confidence limits: _____

Method of LC50 calculation: _____

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APPLICATIONS TEAM

Applicant _____

TNRCC, NPDES, and/or TPDES Permit Number _____

Outfall _____

TABLE D-2 (SHEET 1 OF 2)

Mysidopsis bahia SURVIVAL

GENERAL INFORMATION

	Time (am/pm)	Date
Composite Sample Collected		
Test Initiated		

PERCENT SURVIVAL

Time	Rep	Percent effluent (%)					
		0%	6%	13%	25%	50%	100%
24h	A						
	B						
	C						
	D						
	E						
	MEAN						

1. Enter percent effluent corresponding to the LC50 below:

24 hour LC50 (*Mysidopsis*) = _____% effluent

95% confidence limits: _____

Method of LC50 calculation: _____

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APPLICATIONS TEAM

Applicant _____

TNRCC, NPDES, and/or TPDES Permit Number _____

Outfall _____

TABLE D-2 (SHEET 2 OF 2)

INLAND SILVERSIDE MINNOW SURVIVAL
(Menidia beryllina)

GENERAL INFORMATION

	Time (am/pm)	Date
Composite Sample Collected		
Test Initiated		

PERCENT SURVIVAL

Time	Rep	Percent effluent (%)					
		0%	6%	13%	25%	50%	100%
24h	A						
	B						
	C						
	D						
	E						
	MEAN						

1. Enter percent effluent corresponding to the LC50 below:

24 hour LC50 (Menidia) = _____% effluent

95% confidence limits: _____

Method of LC50 calculation: _____

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WATER PERMITS
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ATTACHMENT E

RECEIVING WATERS

All applicants must submit USGS quadrangle maps showing the location of the facility and the discharge point(s) and/or the land treatment/land application area, as appropriate. If this is an application for a discharge permit, USGS quadrangle maps must be submitted that depict the discharge route for three (3) miles from the point of discharge (or until a classified segment as defined in 30 TAC Chapter 307, Appendix C, Texas Surface Water Quality Standards is reached).

The permittee should retain a copy of the information submitted with this Attachment for reference in subsequent applications.

APPLICATIONS FOR A PERMIT TO DISPOSE OF ALL WASTEWATER BY LAND DISPOSAL ARE NOT REQUIRED TO COMPLETE ATTACHMENT E, SECTION 1 OR 2.

SECTION 1

DESCRIPTION OF RECEIVING WATERS

If all outfalls do not enter the same receiving water, SECTION 1 must be completed for each receiving water. The outfalls that flow into each receiving water should be listed.

OUTFALL NUMBER(S) 001,101, 002, 003

1. Is there a surface water intake for domestic drinking water supply located within 5 (five) miles downstream from the point/proposed point of discharge?
   _____ YES ___X___ NO.

   If YES, identify owner of the drinking water supply and accurately locate it on the USGS 7.5-minute topographic map. _____

2. For discharges into tidally affected waters,

   a) What is the width of the receiving water at the outfall? N/A _____ feet

   b) Are there oyster reefs in the vicinity of the discharge? _____

      If YES, give approximate distance from outfall(s). _____ feet

3. Is the discharge directly into (or within 300 feet of) a classified segment as defined in Appendix C or a partially classified water body as defined in Appendix D of the Texas Surface Water Quality Standards (30 TAC 307.10)?

   _____ YES If YES, stop here. SECTION 1 is complete. It is not necessary to complete SECTION 2.

   ___X___ NO Check NO if the discharge goes into a watercourse such as a creek or tributary prior to flowing into a classified segment and then complete Items 4 and 5. (Complete SECTION 2 only if appropriate.)

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OUTFALL NUMBER(S) 001,101,002,003

The following questions refer to the immediate receiving water (e.g., a drainage ditch, a stream, a lake, a bay, etc.). Check the box which best describes the first receiving water into which the discharge will flow after it leaves the outfall and answer any associated questions.

4. The receiving water can best be described as:

a. [ ] Open Bay: Name _____

b. [ ] Tidal Stream, Bayou, or Marsh: Name _____

c. [X] Lake or Pond: Name Welsh Reservoir

(1) Surface area 1365 acres

(2) Average depth of the entire water body 10 feet

(3) Approximate average depth of water body within a 500 foot radius of the discharge point 10 feet

d. [ ] Stream OR [ ] Man-made Channel or Ditch:

Name/Number N/A

(1) Stream or Channel Type: Characterize the area upstream of the discharge by checking one of the boxes below. (For a new discharge, characterize downstream area.) N/A

(a) [ ] Intermittent (dry for at least one week during most years)

(b) [ ] Intermittent with Persistent Pools (enduring pools containing sufficient habitat to maintain significant aquatic life uses)

(c) [ ] Perennial (normally flowing)

(2) Characterize the stream channel modifications (check as appropriate): N/A

[ ] channelized [ ] dammed [ ] banks rip-rapped
[ ] leveed [ ] concrete lined [ ] others, specify:

_____

(3) List the name(s) of any perennial streams which join the receiving water within three miles downstream of the discharge point:

N/A

_____

_____

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(4) Do the receiving water characteristics change within three miles downstream of the discharge? (e.g., natural or man-made dams, ponds, reservoirs, etc.)

YES _____ NO _____. If YES, state how:

N/A

(5) Basis of flow assessment (for answer to item d(1): [ ] USGS flow records, [ ] personal observation, [ ] historical observation of adjacent landowner(s),
[ ] other, specify

N/A

(6) General observations of water body during normal dry weather conditions:

Date and time of observation: _____

Was water body influenced by storm water runoff during observations?

N/A

e. [ ] Freshwater Swamp or Marsh: Name N/A

f. [ ] Other, Specify N/A

5. General Characteristics of Water Body:

a. Is the receiving water upstream of the discharge or proposed discharge site influenced by (check as appropriate):

[ ] oil field activities
[X] agricultural runoff
[ ] upstream discharges
[ ] urban runoff
[ ] septic tanks
[ ] others, specify:

b. Uses of water body (observed or evidences of) (Check as appropriate):

[ ] livestock watering
[X] non contact recreation
[ ] domestic water supply
[ ] irrigation withdrawal
[ ] picnic or park activities
[ ] others, specify:
[X] contact recreation
[X] fishing
[X] industrial water supply
[ ] navigation

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c. Select one of the following to best describe the aesthetics of the receiving water and the surrounding area (check one):

[ ] Wilderness: outstanding natural beauty; usually wooded or unpastured area; water clarity exceptional

[X] Natural Area: trees and/or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity discolored

[ ] Common Setting: not offensive, developed but uncluttered; water may be colored or turbid

[ ] Offensive: stream does not enhance aesthetics; cluttered; highly developed; dumping areas; water discolored

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ATTACHMENT E

SECTION 2

N/A

SECTION 2 IS REQUIRED FOR INDUSTRIAL WASTEWATER PERMIT APPLICATIONS FOR NEW OUTFALLS AND FOR ALL EPA CLASSIFIED MAJOR FACILITIES

NOTE THAT SECTION 2 APPLIES ONLY TO PERENNIAL STREAMS AND INTERMITTENT STREAMS WITH PERSISTENT (PERENNIAL) POOLS AS IDENTIFIED IN SECTION 1, ITEM 4.d.(1). IF THE DISCHARGE IS DIRECTLY TO A CLASSIFIED SEGMENT AS DEFINED IN APPENDIX C OR TO A PARTIALLY CLASSIFIED WATER BODY AS DEFINED IN APPENDIX D OF THE TEXAS SURFACE WATER QUALITY STANDARDS (30 TAC 307.10), THEN IT IS NOT NECESSARY TO COMPLETE SECTION 2. IF THE INFORMATION REQUIRED IN THIS SECTION HAS BEEN PROVIDED IN A PREVIOUS APPLICATION, PLEASE RESUBMIT THE INFORMATION.

DETERMINATION OF PHYSICAL CHARACTERISTICS OF A WATER BODY

Use the "Stream Physical Characteristics Worksheet," SECTION B (PART I), to record the required data. Summarize and average the data from the worksheets and complete SECTION B (PART II), Physical Characteristics of Water Body. On an attached USGS Quadrangle map locate the existing or proposed discharge point(s) and locations of transect measurements.

Definitions of technical terms follow this discussion.

CONDUCT THE PHYSICAL ASSESSMENT DOWNSTREAM OF THE PROPOSED OR EXISTING OUTFALL. Use the attached "Stream Physical Characteristics Worksheet," SECTION B (PART I), to summarize measurements. The worksheet is divided into two portions. The upper portion is for general observations made over the entire reach, while the lower or boxed portions are for measurements and observations made at specific transect locations.

Transect measurements are usually made beginning at the point of outfall and continuing downstream. Once these are completed general observations are made over the reach while returning to the point of outfall.

Observe or measure stream widths at a minimum of four and a maximum of ten equally spaced locations over a 0.5 mile reach. The number of transects made depends upon width variability. At each point where width measurements are made, also measure the water depth at 4-10 points across the transect. Include transects within each habitat type (pool, riffle, run, glide) if they exist. If pools are present, include measurements across the deepest area.

Characterize each transect site as riffle, run, glide or pool.

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After finishing the transect measurements, complete the general observation portion of the worksheet. Count the number of stream bends and determine their definition (well, moderate, poor.) Count the number of riffles and estimate the magnitude of flow fluctuations. Look for evidence of debris in bank trees or its position on stream banks (upper, middle, lower.) Another indication is how well stream flow covers the channel. If water has receded from banks exposing bottom substrates, fluctuations may be severe. The best source of evidence is historical USGS stream flow records, if available. Indicate observed channel obstructions (fences, log jams, culverts, low water bridges, etc.) and channel modifications (channelized, cleared, leveed, concrete lined, rip-rapping, etc.).

At an appropriate location within the stream reach, measure stream flow. **IT IS VERY IMPORTANT TO IDENTIFY THE FLOW MEASUREMENT METHOD.**

DEFINITIONS

Glide - Portion of the water column that resembles flow that would be found in a shallow canal. Water surface gradient over a glide is nearly zero, so velocity is slow, but flow is shore to shore without eddy development.

Pool - An area of the water column that has slow velocity and is deeper than a riffle, run, or glide. The water surface gradient of pools is very close to zero and their channel profile is usually concave. Pools often have eddies with varying directions of flow.

Riffle - Portion of water column that is usually constricted where water velocity is fast due to a change in surface gradient. Stream depth is generally shallow and the channel profile is usually straight to convex. Surface flow through riffles usually ripples due to constriction, shallowness, and presence of irregular bottom substrates.

Run - Portion of the water column that has rapid nonturbulent shore to shore flow. A run is too deep to be a riffle and flow is too fast to be a pool. The channel profile under a run is usually a uniform flat plane.

Stream Bend - Curved part of a stream. A well defined bend has a deep outside area and shallow inside area accentuated by point bar development. Due to sharp bending, stream flow is forced to the outside and eddies develop on the inside of the bend. A moderately developed bend forces some flow to the outside and has only a slight change in depth across the channel. A poorly defined bend has no noticeable change in water depth across the channel, and stream flow is generally not forced to one side.

Stream Depth - The vertical height of the water column from the existing water surface level to the channel bottom.

Stream Width - The horizontal distance along the transect line from shore to shore along the existing water surface.

Transect Line - A straight line, perpendicular to stream flow, between two points on opposite stream banks.

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ATTACHMENT E

SECTION 2 (Part I) - Stream Physical Characteristics Worksheet

Date: _____ Time: _____

Stream name: _____

Location: _____

Type of stream upstream of existing discharges or downstream of proposed discharges:

(Check one) [ ] perennial [ ] intermittent with persistent pools

THE FOLLOWING INFORMATION IS TO BE PROVIDED FOR THE STREAM DOWNSTREAM OF EXISTING OR PROPOSED DISCHARGES

No. of stream bends: well defined _____
moderately defined _____
poorly defined _____

No. of riffles _____

Flow fluctuations (check one): [ ] minor; [ ] moderate; [ ] severe

Evidence of flow fluctuations _____

Observed stream uses _____

Channel obstructions/modifications _____

Stream Type at Transect Location: riffle ☐, run ☐, glide ☐, pool☐ (check one)

Location of Transect	Water Surface Width (ft)	Stream Depths (ft) at Points Across Transect (channel bed to water surface)									

Stream Type at Transect Location: riffle ☐, run ☐, glide ☐, pool☐ (check one)

Location of Transect	Water Surface Width (ft)	Stream Depths (ft) at Points Across Transect (channel bed to water surface)									

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Stream Type at Transect Location: riffle ☐, run ☐, glide ☐, pool☐ (check one)

Location of Transect	Water Surface Width (ft)	Stream Depths (ft) at Points Across Transect (channel bed to water surface)									

Stream Type at Transect Location: riffle ☐, run ☐, glide ☐, pool☐ (check one)

Location of Transect	Water Surface Width (ft)	Stream Depths (ft) at Points Across Transect (channel bed to water surface)									

Stream Type at Transect Location: riffle ☐, run ☐, glide ☐, pool☐ (check one)

Location of Transect	Water Surface Width (ft)	Stream Depths (ft) at Points Across Transect (channel bed to water surface)									

Stream Type at Transect Location: riffle ☐, run ☐, glide ☐, pool☐ (check one)

Location of Transect	Water Surface Width (ft)	Stream Depths (ft) at Points Across Transect (channel bed to water surface)									

Stream Type at Transect Location: riffle ☐, run ☐, glide ☐, pool☐ (check one)

Location of Transect	Water Surface Width (ft)	Stream Depths (ft) at Points Across Transect (channel bed to water surface)									

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ATTACHMENT E

SECTION B (PART II) - Physical Characteristics of Water Body

Streambed slope of entire reach (from USGS map in ft./ft.) _____

Approximate drainage area above the most downstream transect (from USGS map or county highway map in mi^2 _____

Length of stream evaluated (in feet) _____

Number of lateral transects made _____

Average stream width (in feet) _____

Average stream depth (in feet) _____

Instantaneous stream flow (in ft^3/sec) _____

Indicate flow measurement method
(VERY IMPORTANT - type of meter, floating chip timed over a fixed distance, etc.) _____

Flow fluctuations (minor, moderate, severe) _____

Size of pools (large, small , moderate, none) _____

Maximum pool depth (in feet) _____

Total number of stream bends _____

Number well defined _____

Number moderately defined _____

Number poorly defined _____

Total number of riffles _____

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ATTACHMENT F

SEWAGE SLUDGE MANAGEMENT AND DISPOSAL

N/A

This attachment is for the management and final disposal of sewage sludge from your facility. Please answer all questions and provide all the information required.

Under some circumstances (as directed in this attachment), you may be required to submit the SEWAGE SLUDGE TECHNICAL REPORT as a supplement to this application. Please refer to the APPLICATION INSTRUCTIONS FOR WASTEWATER/SLUDGE PERMIT for methods of obtaining the SEWAGE SLUDGE TECHNICAL REPORT.

Is this a new permit application or an amendment permit application?
YES ____ NO ____ If YES, complete item 1.

Is this an application (new, amendment or renewal) for a facility discharging into the Lake Houston Watershed?
YES ____ NO ____ If YES, complete item 1.

Note that all permit applications for facilities that discharge to Segment Nos. 1002, 1003, 1004, 1008, 1009, 1010, 1011, and 1015 are required to complete item 1. The Lake Houston Watershed is defined in 30 TAC Section 311.31 as the entire drainage area of Lake Houston, with the exception of that portion of the drainage basin of the West Fork of the San Jacinto River which lies upstream of the Lake Conroe Dam.

1. SLUDGE MANAGEMENT AND DISPOSAL

Provide a solids management plan that includes:

a. The dimensions and capacities of all sewage sludge handling and treatment units and processes.

b. Calculations showing the amount of solids generated at design flow and at 75 percent, 50 percent and 25 percent of design flow.

c. Operating range for mixed liquor suspended solids in the treatment process based on the projected actual and design flow expected at the facility.

d. A description of the procedure and method of solids removal from both the wastewater and sludge treatment processes.

e. Quantity of solids to be removed from the process and schedule for removal of solids that is designed to maintain an appropriate solids inventory.

f. Identification and ownership of the ultimate disposal site and a system of documenting the amount of solids disposed of in dry weight form.

g. If the treatment system utilizes facultative lagoons, provide calculations describing the design life of the sludge holding volume of the ponds. Provide the location and depth of any monitoring wells located in the area of and adjacent to the facultative lagoons. Describe how the sludge will ultimately be disposed of upon reaching this design life.

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ITEMS 2 THRU 9 ARE REQUIRED FOR ALL (NEW, AMENDMENT, AND RENEWAL) PERMIT APPLICATIONS.

N/A

2. Is sewage sludge disposed of at a TNRCC Permitted co-disposal landfill?
YES ____ NO ____ If YES, complete the following:

   a. Site name and TNRCC permit number:

   _____

   b. Owner/operator: _____

   c. Location (include county): _____

   _____

   d. Transported by (truck, train, pipe, other):

   _____

   e. If hauled by motorized vehicle, name and TNRCC registration number of hauler:

   _____

   f. Method of sludge dewatering (drying beds, etc.) for landfilling and average percent solids of landfilled sludge:

   _____

   _____

3. Is sewage sludge transported to another plant for further treatment and disposal?
YES _____ NO _____ If YES, complete the following:

   a. Plant to receive sludge, name and TNRCC Permit No: _____

   _____

   b. Transported by (truck, pipe, etc.): _____
   If hauled by motorized vehicle, provide Transporter's TNRCC Registration number: _____

   c. Attach a written statement or a copy of contractual agreements confirming that the plant identified above will accept and be responsible for the sludge from the plant for the life of the permit (at least five years).

4. Are you requesting to continue the current authorization in your existing permit to beneficially land apply sewage sludge at this site or a site under your direct control?
YES _____ NO _____

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N/A

Are you requesting a new authorization to beneficially land apply sewage sludge at this site or a site under your direct control?
YES _____ NO _____

If YES to either question, provide the information required in the SEWAGE SLUDGE TECHNICAL REPORT.

If NO to both questions and your sewage sludge is beneficially land applied, provide the following information:

a. _____ Reclamation; _____ Soil Conditioning;

b. Transported by: _____

Transporter's TNRCC Registration Number: _____

c. Transported in: _____ liquid _____ semi-liquid

_____ semi-solid _____ solid state

d. Location of disposal site (include county) and name of owner:

_____

e. Site name and TNRCC Registration Number:

_____

5. a. Are you currently authorized in your existing permit to utilize composting of sewage sludge at this site or for a site under your control?
YES _____ NO _____ If YES, provide the following:

(1) Date operation commenced: _____

(2) Location of operation: _____

(3) Type of bulking agent: _____

(4) Approximate amount of sludge composted: _____

(5) A brief description of composting process: _____

_____

_____

_____

(6) Identify any significant changes in composting process since the last permit issuance: _____

_____

_____

b. Are you requesting authorization to compost sewage sludge?
YES _____ NO _____ If YES, provide the information required in the SEWAGE SLUDGE TECHNICAL REPORT.

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N/A

6. a. Are you currently authorized in your existing permit to utilize marketing and distribution of sewage sludge at this site or for a site under your control? YES _____ NO _____

If YES and you received authorization prior to August 19, 1993, provide the information required in the SEWAGE SLUDGE TECHNICAL REPORT.

If YES and you received authorization after August 19, 1993, or your sewage sludge is marketed and distributed by someone else provide the following information:

(1) TNRCC permit number: _____

(2) Site used for distribution storage center:

_____

(3) Type of storage: _____

(4) Type of treatment: _____

(5) Type of record keeping: _____

b. Are you requesting authorization to market and distribute sewage sludge at this facility or a facility under your direct control?
YES _____ NO _____ If YES, provide the information required in the SEWAGE SLUDGE TECHNICAL REPORT.

7. a. Are you currently authorized in your existing permit to utilize surface disposal of sewage sludge at this site or a site under your direct control?
YES _____ NO _____

If YES and you received authorization prior to August 19, 1993 provide the information required in the SEWAGE SLUDGE TECHNICAL REPORT.

If YES and you received authorization after August 19, 1993, provide the following information:

(1) Site name and TNRCC permit number: _____

(2) Owner/operator: _____

(3) Location: _____

(4) Transported by (truck, train, pipe, other):

_____

(5) If hauled by motorized vehicle, name and TNRCC Registration Number of transporter:

_____

(6) Method of sludge dewatering (drying beds, etc.) for landfilling and average percent solids of landfilled sludge:

_____

(7) Describe the type of landfill (e.g., trench, aerial)

_____

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N/A

b. Are you requesting authorization to surface dispose sewage sludge at this site or site under your direct control?
YES _____ NO _____ If YES, provide the information required in the SEWAGE SLUDGE TECHNICAL REPORT.

8. Are you currently authorized in your existing permit or are you seeking authorization to utilize sludge lagoons on property owned and/or under your direct control?
YES _____ NO _____ If YES, provide the following information:

a. Number of lagoons: _____

b. Surface area of each lagoon: _____

Average depth of each lagoon: _____

c. Location: _____

_____

d. Pond lining or plans for lining: _____

_____

_____

e. Depth to shallowest groundwater: _____
Provide a profile of soil types encountered down to the groundwater table.

f. Describe method to control extraneous surface water from entering site:

_____

_____

g. Provide a closure plan for the site.

h. If the site includes monitoring wells, provide information including location, depth of wells and monitoring results.

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N/A

i. Ultimate method for sludge disposal:

_____

_____

j. Provide a schedule for removal of solids. If storage time exceeds 2 years, justification for on-site storage will need to be provided. If storage time exceeds 5 years, complete the SEWAGE SLUDGE TECHNICAL REPORT.

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ATTACHMENT G

INDUSTRIAL WASTE CONTRIBUTION

N/A

PUBLICLY OWNED TREATMENT WORKS (POTWs) that meet the following requirements must provide the industrial waste contribution information in this attachment:

1. Facilities with a design/permitted flow of 1.0 MGD or greater;

2. For facilities with multiple permit phases, facilities with an authorized or proposed phase with a design flow of 1.0 MGD or greater; or

3. Facilities that have or are required to have an approved pretreatment program.

4. Facilities that have or are requesting authorization to land apply sewage sludge for beneficial use in this permit.

Please note that (1) privately-owned facilities, and (2) POTWs with a design/permitted flow less that 1.0 MGD that do not have a pretreatment program, are not required to complete and submit this attachment:

DEFINITIONS

Industrial User (IU) - Any industrial or commercial entity that discharges wastewater to the treatment works that is not domestic wastewater. Domestic wastewater includes wastewater from connections to houses, hotels, non-industrial office buildings, institutions, or sanitary waste from industrial facilities. The number of IUs is the total number of industrial and commercials users that discharge to the treatment works.

Significant Industrial User (SIU) - An industrial user defined in 40 CFR Section 403.3(t) as follows:

1) subject to Categorical Pretreatment Standards under 40 CFR Section 403.6 and 40 CFR Chapter I, Subchapter N; and
2) any other industrial user that:
   a) Discharges an average of 25,000 gallons per day or more of process wastewater to the treatment works (excluding sanitary, noncontact cooling and boiler blowdown wastewater);
   b) Contributes a process waste stream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the treatment works; or,
   c) Is designated as such by the Control Authority as defined in 40 CFR Section 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the treatment works operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR Section 403.8(f)(6)).

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Categorical Industrial User (CIU) - An industrial user that is subject to Categorical Pretreatment Standards under 40 CFR Section 403.6 and 40 CFR Chapter I, Subchapter N, which are technology-based standards developed by EPA setting industry-specific effluent limits. (A list of industrial categories subject to Categorical Pretreatment Standards is included in the APPLICATION INSTRUCTIONS FOR WASTEWATER/SLUDGE PERMIT.)

1. All Publicly Owned Treatment Works (POTWs) that accept process wastewater from any Significant Industrial User (SIU) must complete the following:

   a. Does your POTW have or is it required to develop an approved pretreatment program? YES _____ NO __X__

   If YES, please note that following TPDES permit issuance, all POTWs with an approved pretreatment program, or a requirement to develop an approved pretreatment program, must provide a written technical evaluation of the need to modify the POTW's pretreatment program and revise their technically based local limits under 40 CFR Section 403.5(c)(1).

   b. If YES to item b, have there been any substantial modifications to the POTW's approved pretreatment program that have not been approved in accordance with 40 CFR Section 403.18? YES _____ NO _____

   If YES to item a, identify, on a separate attachment, all substantial modifications that have not been approved.

   c. Number of Categorical Industrial Users (CIUs) and Significant Industrial Users (SIUs).

      (1) Provide the number of each of the following types of industrial users that discharge to your POTW.

      Number of CIUs _____

      Number of non-categorical SIUs _____

      Number of other non-regulated IU's _____

      (2) Average Daily flow from Industrial Users. Estimate the total average daily wastewater flow from all industrial users.

      CIUs only _____ MGD

      Noncategorical SIUs only _____ MGD

      Total average daily flow _____ MGD

   d. In the past three years, has your POTW experienced treatment plant upset or interference as defined in 40 CFR Part 403?
   YES _____ NO _____

   If YES, on a separate attachment, identify all dates, duration, description of upset, probable cause(s) and possible source(s).

   e. In the past three years, has your POTW experienced pass through as defined in 40 CFR Part 403?
   YES _____ NO _____

   If YES, on a separate attachment, identify all dates, duration, description of pollutants passing through the treatment plant, probable cause(s) and possible source(s).

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2. If your POTW has an approved pretreatment program, please list any and all parameters measured above the MAL in your POTW's effluent during the past three years annual monitoring scan according to the requirements in the pretreatment section of your TPDES permit.

Pollutant	Concentration	MAL	Units	Date
	N/A			

If retests were done subsequent to the above annual testing for any parameters identified in your POTW's effluent above the MAL, please identify all retest parameters, concentrations, MALs and dates. Attach additional sheets as necessary.

POTWs THAT DO NOT HAVE AN APPROVED PRETREATMENT PROGRAM ARE REQUIRED TO PROVIDE THE INFORMATION IN THE FOLLOWING ITEM NO. 3. (POTWs that have an approved pretreatment program do not need to complete item 3.)

Significant Industrial User Information

a) Provide the name and mailing address of each SIU.

b) Describe the actual process(es) (rather than simply listing them) at the SIU that affect or contribute to the SIU's discharge. For example, in describing a metal finishing operation, include such information as how the product is cleaned prior to finishing, what type of plating baths are in operation (e.g., nickel, chromium), how paint is applied, and how the product is polished. Attach additional sheets if necessary.

c) List principal products that the SIU generates, the raw materials and the rate at which those raw materials are used to manufacture the products.

d) Flow rate. Process wastewater means any water that, during manufacturing or processing, comes in direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product. Indicate the average daily volume, in gallons per day, of process wastewater and non-process wastewater that the SIU discharges into the collection system. Specify whether discharges are continuous or batch (non-continuous).

e) Indicate whether the SIU is subject to technically based local limits (TBLLs) and/or categorical pretreatment standards. Technically based local limits are enforceable local requirements developed by treatment works to address federal standards as well as state and local regulations and requirements. Categorical Pretreatment Standards are national technology-based standards developed by EPA, setting industry-specific effluent limits. These standards are implemented by 40 CFR Parts 403-471.

f) Provide information concerning any problems the treatment works has experienced that are attributable to discharges from the SIUs. Problems may include upsets, interferences or pass through at the plant, corrosion in the collection system, or other similar events.

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3. Significant Industrial User (SIU) Information. Provide the name, address and requested information of each SIU, as defined in 40 CFR Part 403, discharging to your POTW. (Submit additional pages as necessary.)

a. Name: _____

Mailing address: _____

b. Industrial processes that affect or contribute to the SIU's discharge:

_____

_____

_____

c. Principal product(s): _____

_____

_____

Raw materials annual usage _____

d. Flow rate information: Indicate the current daily average volume discharged into the POTW collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent (batch discharge).

Process wastewater flow rate:

_____ gpd (_____ Continuous or _____ Batch frequency)

Non-process wastewater flow rate:

_____ gpd (_____ Continuous or _____ Intermittent)

e. Pretreatment Standards: Indicate whether the SIU is subject to the following:

Technically based local limits: YES _____ NO _____
Categorical pretreatment standards: YES _____ NO _____

If subject to categorical pretreatment standards, which category and subcategory?

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Category(ies)	Subcategory(ies)			
_____,	_____,	_____,	_____,	_____
_____,	_____,	_____,	_____,	_____
_____,	_____,	_____,	_____,	_____
_____,	_____,	_____,	_____,	_____

f. Problems at the POTW attributed to the waste discharged by the SIU:
Has the SIU caused or contributed to any problems (e.g., upsets, interferences, pass through) at your POTW in the past three years?
YES _____ NO _____

If YES, describe each episode, including dates, duration, description of problems, probable pollutants, etc. on a separate attachment.

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ATTACHMENT H

HAZARDOUS SUBSTANCES REQUIRED TO BE IDENTIFIED IF EXPECTED TO BE PRESENT

Attachment H is a list of hazardous substances which are required to be identified by the applicant if expected to be present in any wastewater discharged or disposed of via this permit. Please check all substances listed below which are expected to be present in the effluent. If none of the substances listed below are expected to be present then please check the following statement to verify that all of the hazardous substances listed in Attachment H have been reviewed.

__X__ All of the hazardous substances and toxic pollutants listed in Attachment H have been reviewed for possible presence in the effluent discharged/disposed of via the proposed permit.

Toxic Pollutant

_____ Asbestos

Hazardous Substances

_____ Acetaldehyde
_____ Allyl alcohol
_____ Allyl chloride
_____ Amyl acetate
_____ Anilin
_____ Benzonitrile
_____ Benzyl chloride
_____ Butyl acetate
_____ Butylamine
_____ Carbofuran
_____ Carbon disulfide
_____ Coumaphos
_____ Cresol
_____ Crotonaldehyde
_____ Cyclohexane
_____ Dicamba
_____ Dichlobenil
_____ Dichlone
_____ 2,2-Dichloropropionic acid
_____ Dichlorvos
_____ Diethylamine
_____ Dimethylamine
_____ Dinitrobenzene
_____ Diquat
_____ Disulfoton
_____ Diuron
_____ Epichlorohydrin
_____ Ethion
_____ Ethylene diamine
_____ Formaldehyde
_____ Furfural
_____ Isoprene
_____ Isopropanolamine
_____ Kepone
_____ Mercaptodimethur
_____ Methyl mercaptan
_____ Methyl methacrylate
_____ Mevinphos
_____ Mexacarbate
_____ Monoethylamine
_____ Monomethylamine
_____ Naled
_____ Naphthenic acid
_____ Nitrotoluene
_____ Phenolsulfonate
_____ Phosgene
_____ Propargite
_____ Propylene oxide
_____ Pyrethrins
_____ Quinoline
_____ Resorcinol
_____ Strontium
_____ Strychnine
_____ Styrene
_____ 2,4,5-T
(2,4,5 Trichlorophenoxyacetic acid)
_____ TDE
(Tetrachlorodiphenylethane)
_____ Trichlorofan
_____ Triethylamine
_____ Trimethylamine
_____ Uranium
_____ Vanadium
_____ Vinyl acetate
_____ Xylene
_____ Xylenol
_____ Zirconium

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ATTACHMENT I

POLLUTION PREVENTION

This attachment is intended to gather information on your facility's efforts for pollution prevention. Please answer all questions of this attachment and provide all the information required with your application.

1. Have you instituted or continued programs directed toward pollution prevention (P2), especially to incorporate water conservation, source reduction, waste minimization, and/or recycling?

   YES X NO _____

   If YES, provide a brief summary of the program(s) that incorporate water conservation, source reduction, waste minimization, recycling, and/or any other elements that are similar to the suggestions above. **PLEASE DO NOT SUBMIT DETAILED PLANS OR REPORTS WITH THIS APPLICATION.**

   Waste minimization, and recycling

2. Have you collected and compiled reliable data to record trends of actual reductions of pollutants in either pounds per day or percent reductions?
   YES _____ NO X

   If YES, provide a brief summary of the actual or percent reductions. **PLEASE DO NOT SUBMIT DETAILED PLANS OR REPORTS WITH THIS APPLICATION.**

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3. The TNRCC ecourages facilities to develope and implement new pollution prevention programs or modify existing pollution prevention programs for your facility. Following are some components that may be considered when developing a pollution prevention program. **PLEASE DO NOT SUBMIT ANY RESPONSE FOR THIS ITEM, THIS IS PROVIDED IN THE APPLICATION FOR INFORMATIONAL PURPOSES ONLY.**

a. Develop a Pollution Prevention Mission Statement, incorporating economic growth and ensuring environmental protection of your watershed.

b. Develop Your Industry's Policy Statements on Pollution Prevention.
   (1) Promote Water Conservation, Source Reduction, Waste Minimization and Recycling.
   (2) Apply policy statements to any and all departments and processes of your industry.

c. Incorporate P2 plans and best management practices as part of industrial process and wastewater plant designs.

d. Learn about Pollution Prevention Opportunities for Your Specific Industry.
   (1) Research potential areas where P2 may be incorporated into your industry's processes and operations through a P2 self-assessment.
   (2) Provide P2 information, contact persons and telephone numbers to your management and other similar industries.
   (3) Use the internet as a resource.

e. Serve as a Role Model.
   (1) Coordinate recycling efforts with the city government and between industries.
   (2) Arrange an industrial user mentor program.
   (3) Provide meeting facilities for other industries in your watershed and other industry groups.

f. Use the Media and Local Resources.
   (1) Request local universities provide technical expertise.
   (2) Send public service announcements to newspapers, radio, and local television stations to communicate your industry's purpose in P2 activities, meeting times and locations.
   (3) Ensure the success of your programs by involving your community, including other industry organizations and asking for feedback.

g. Educate Your Industry and Community.
   (1) Train staff (including management) and introduce P2 principles and activities during the process operations and wastewater treatment plant.
   (2) Request that industry leaders influence and support P2 curriculum and terminology taught at all levels in community schools and universities.

h. Establish Reliable Data
   (1) Collect and compile reliable data to record trends of actual reductions of pollutants in either pounds per day or percent reductions.
   (2) Develop, implement, and track the success of your organization's P2 plan as an example for other industries.

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i. Evaluate Why Pollution Prevention is Important to Your Industry.
   (1) Knowing that water is a limited resource, establish rationale for your industry to save water.
   (2) Prepare for Total Maximum Daily Loads (TMDLs) that may be developed in your watershed - TMDLs define the limits to what a watershed can receive.
   (3) Assist other industries in your watershed to encourage them to reduce pollutant contributions.

j. Optimize the efficiency and extending the useful life of the wastewater plant. The following items should be considered:
   (1) The influent loadings, flow and design capacity.
   (2) The effluent quality and wastewater plant performance.
   (3) The age and expected life of the wastewater plant's equipment.
   (4) Bypasses and overflows of the wastewater plant.
   (5) New developments at the facility.
   (6) Training plans and status.
   (7) The financial status of the facility.
   (8) Preventative maintenance programs and equipment condition.
   (9) An overall evaluation of conditions at the facility.

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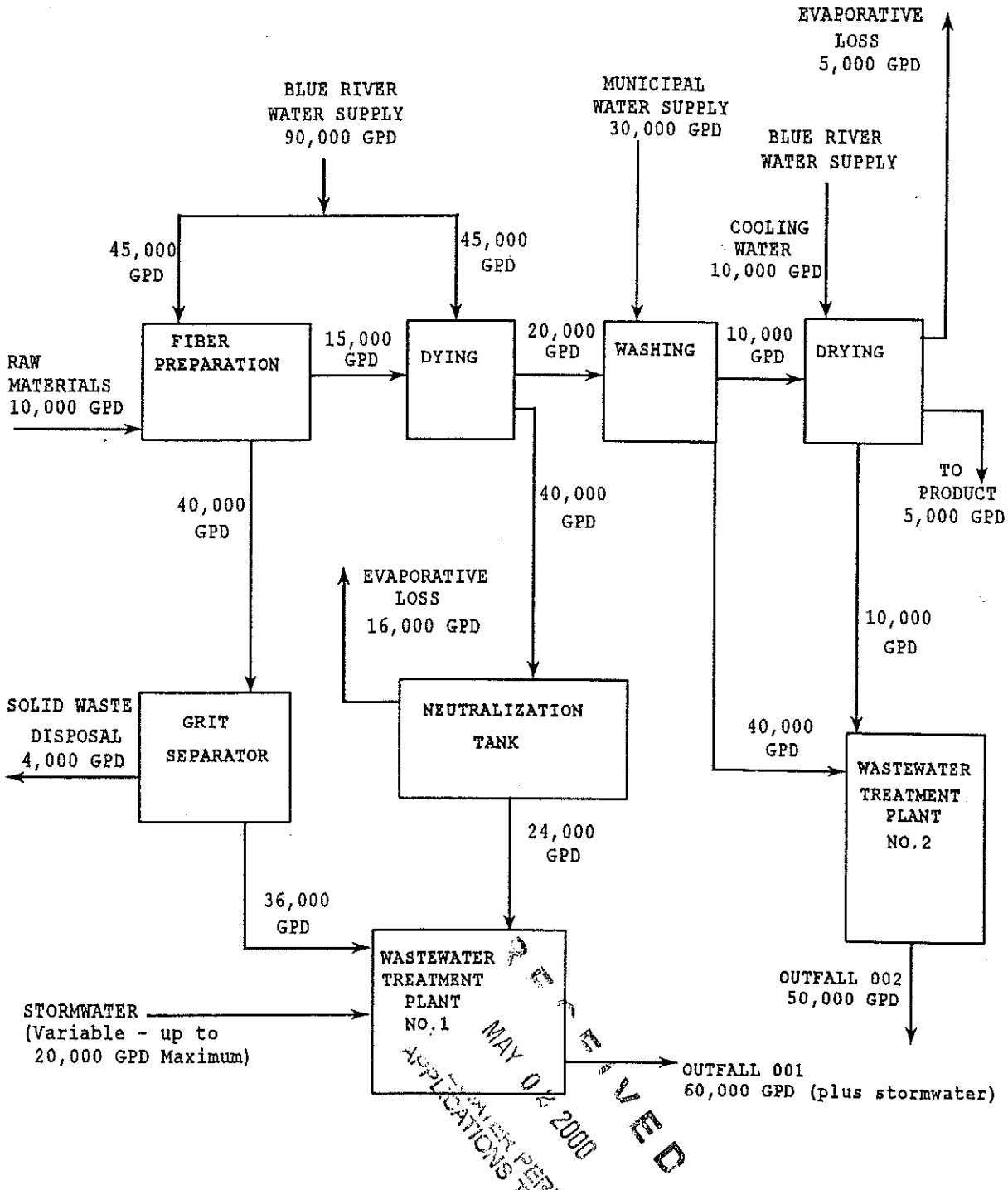
ATTACHMENT J

SCHEMATIC OF WASTEWATER FLOWS

EXAMPLE



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ATTACHMENT K

STORM WATER PERMITTING

This attachment is intended to provide information concerning which conditions require individual TPDES permits for storm water discharges. For more detailed information, please refer to 40 CFR Part 122.

1. Dischargers of "storm water associated with industrial activity," as defined in 40 CFR Part 122.26, are required to apply for an individual permit or seek coverage under a promulgated storm water general permit.

2. Storm water discharge associated with industrial activity - means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under 40 CFR part 122.

   a. For the categories of industries identified in subitems (d)(1) through (10) below, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR part 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water.

   b. For the categories of industries identified in subitem (d)(11) below, the term includes only storm water discharges from all the areas (except access roads and rail lines) that are listed in the previous sentence where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water.

   c. For the purposes of this definition, material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas.

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d. The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this definition:

(1) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR subchapter N (except facilities with toxic pollutant effluent standards which are exempted under subitem (d)(11) below.

(2) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283), 29, 311, 32 (except 323), 33, 3441, 373.

(3) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 CFR 434.11(1) because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of non-coal mining operations which have been released from applicable State or Federal reclamation requirements after December 17, 1990) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; (inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator; inactive mining sites do not include sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined materials, nor sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim).

(4) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under subtitle C of RCRA.

(5) Landfills, land application sites, and open dumps that receive or have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under subtitle D of RCRA;

(6) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093.

(7) Steam electric power generating facilities, including coal handling sites.

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(8) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221-25), 43, 44, 45, and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under subitems (d)(1)-(7) or (9)-(1) of this item are associated with industrial activity.

(9) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR part 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with section 405 of the CWA.

(10) Construction activity including clearing, grading and excavation activities except: operations that result in the disturbance of less than five acres of total land area which are not part of a larger common plan of development or sale.

(11) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, [and which are not otherwise included within subitems (2)-(10) above].

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ATTACHMENT L

COUNTIES WITHIN 100 MILES OF FACILITY

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TEXAS
Grayson, Fannin, Lamar, Red River, Titus, Franklin, Hopkins, Delta, Hunt, Collin, Rockwall, Rains, Wood, Upshur, Bowe, Cass, Marion, Harrison, Panola, Shelby, Gregg, San Augustine, Nacogdoces, Rusk, Smith, Cherokee, Anderson, Freestone, Navarro, Henderson, Van Zandt, Kaufman, Dallas

OKLAHOMA:
Bryan, Atoka, Pushmatah, McCurtain, Choctaw

ARKANSAS:
Polk, Howard, Pike, Sevier, Little River, Hempstead, Nevada, Miller, LaFayette, Columbia

LOUISIANA:
Bossier, Claiborne, Webster, Caddo, Benville, Red River, DeSoto, Sabine

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ATTACHMENT M

ORIGINAL USGS TOPOGRAPHIC MAP

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ATTACHMENT N

PROPERTY BOUNDARY MAP

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ATTACHMENT O

ORIGINAL GROUND LEVEL PHOTOGRAPH

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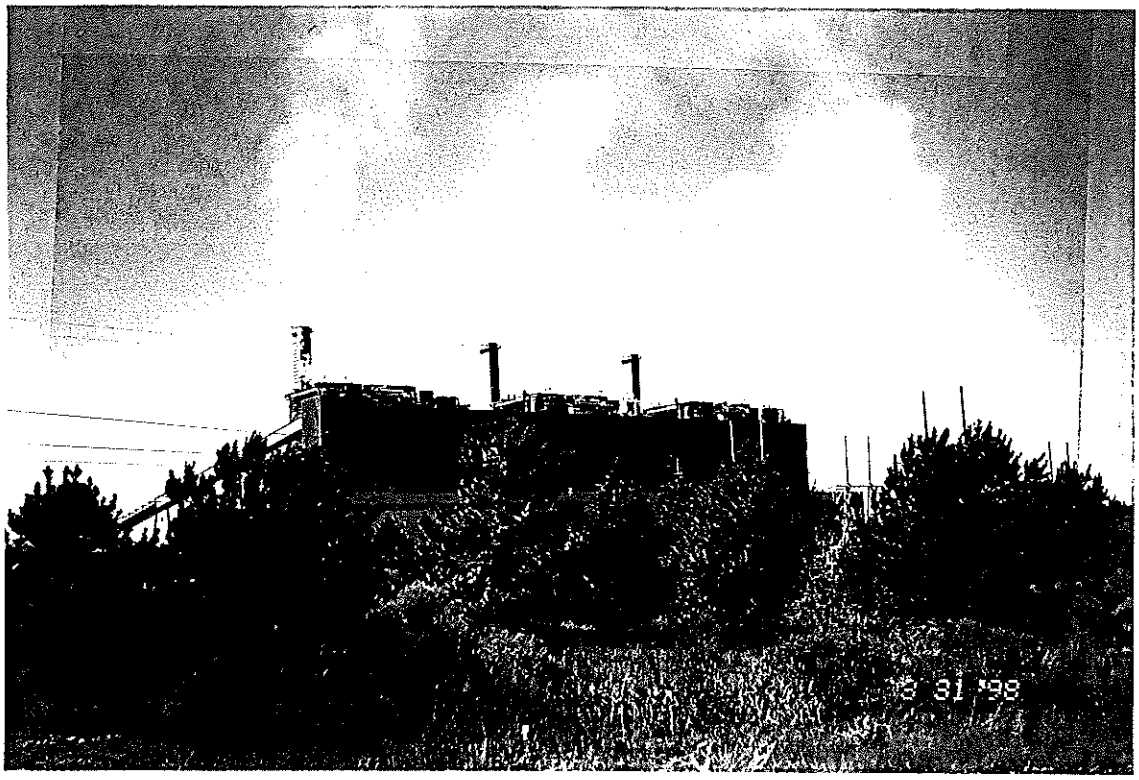

Welsh Power Plant
Facing South

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ATTACHMENT P

FACILITY / SITE INFORMATION

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General Description of Operations

Welsh Power Plant (Welsh) is located in Titus County, Texas, midway between the towns of Daingerfield and Pittsburg. Welsh is one of eight (8) production facilities owned and operated by Southwestern Electric Power Company (SWEPCO), an investor–owned electric utility company. The plant generates and distributes electricity to industrial, commercial, and residential customers in the State of Texas.

Electricity is produced by 3 generating units which are each rated at 528 MW. Total generating capacity at Welsh Power Plant is 1,584 MW. Coal-fired boilers produce steam which drives turbine–generators to make electricity. These boilers generate 3.8 million pounds steam/hr when operating at 2,620 psi and 1,000 deg F.

General Description of Water Discharges

There are two once-through cooling systems (circulating water and service water) which both draw water from Welsh Reservoir. A portion of service water (which may also be drawn from Lake O' The Pines), is treated for boiler makeup. Circulating water is pumped to the main condensers to cool and condense exhaust steam from the turbines. Service water is pumped to the generating units to miscellaneous equipment such as turbine oil and hydrogen coolers. Both cooling systems are non-contact and only pick up heat from the process before discharge. Because all cooling water is non-contact, it is not treated before discharge.

A brief description of each wastewater outfall is as follows:

Outfall	Wastewater Service
001	Discharge from secondary ash pond (settling basin) to Welsh Reservoir
002	Discharge from sanitary sewage treatment system to Welsh Reservoir
003	Discharge of once-through condenser cooling water to Welsh Reservoir
101	Discharge of metal cleaning waste to the ash settling basin and thence to Welsh Reservoir

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ATTACHMENT Q

FACILITY MAP

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ATTACHMENT R

MSDS SHEETS FOR CHEMICAL ADDITIVES

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MATERIAL SAFETY DATA SHEET

PC-9365N ADDITIVE

ID: 8-002591

GENERAL INFORMATION

CHEMLINK CO.
A DIVISION OF PONY INDUSTRIES
2 COUNTRY VIEW ROAD
MALVERN, PA 19355
800/424/9300 CHEMTREC
215/640/2200 CHEMLINK

GENERIC NAME
DOT PROPER SHIPPING NAME — UN/NA NUMBER
HYDRAZINE, AQUEOUS SOLUTION - RQ — UN 2030
DOT HAZARD CLASS
CORROSIVE MATERIAL

- SUMMARY OF HAZARDS

DANGER

PHYSICAL HAZARDS:	CORROSIVE TO METALS
ACUTE HEALTH EFFECTS: (SHORT-TERM)	SEVERE EYE IRRITANT SEVERE SKIN IRRITANT MODERATELY TOXIC BY INHALATION MODERATELY TOXIC BY SKIN ABSORPTION MODERATELY TOXIC BY INGESTION
CHRONIC HEALTH EFFECTS: (LONG-TERM)	THIS MATERIAL CONTAINS 35% HYDRAZINE WHICH THE EPA RATES AS A SUSPECT CARCINOGEN. REGARDING OTHER POTENTIAL CHRONIC HEALTH HAZARDS, SEE SUPPLEMENTAL SHEET.

- COMPONENTS

COMPONENT NAME	CAS NUMBER
WATER	7732-18-5
HYDRAZINE	302-01-2
CARCINOGEN AS LISTED BY IARC	

- PHYSICAL AND CHEMICAL DATA

BOILING POINT
AP 229F
FREEZING POINT
AP -87F
SPECIFIC GRAVITY (H2O=1 AT 39.2F)
AP 1.02 AT 60F
VISCOSITY UNITS, TEMP. (KINEM)
AP 9 25C
VAPOR PRESSURE
N/DA
VAPOR SP GR (AIR=1 AT 60 - 90F)
N/DA
APPEARANCE AND COOR
COLORLESS LIQUID; AMMONIA-LIKE COOR
CONDITIONS AND MATERIALS TO AVOID
AVOID EXPOSURE TO HIGH TEMPERATURES, DIRECT SUN-LIGHT OR OTHER CONDITIONS LEADING TO CONCENTRATION OF MATERIAL BY EVAPORTATION. DO NOT STORE NEAR ORGANIC MATERIALS, OXIDIZING AGENTS OR ACIDS.

PH
AP 10.0
DRY POINT
N/DA
VOLATILE CHARACTERISTICS
NEGLIGIBLE
SOLUBILITY IN WATER
COMPLETE
STABILITY
STABLE
HAZARDOUS POLYMERIZATION
NOT EXPECTED TO OCCUR

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PHYSICAL AND CHEMICAL DATA (continued)

OXIDIZING AGENTS (I.E. HYDROGEN PEROXIDE, NITROGEN TETROXIDE, FLOURINE, HALOGEN FLOURIDES); ACIDS; METAL OXIDES SUCH AS IRON, COPPER, LEAD, MANGANESE
HAZARDOUS DECOMPOSITION PRODUCTS
DECOMPOSITION CAUSED BY HEAT AND/OR PRESENCE OF CATALYSTS OR IONIC IMPURITIES MAY PRODUCE AMMONIA, NITROGEN, AND HYDROGEN

OCCUPATIONAL EXPOSURE LIMITS

SUBSTANCE	SOURCE	DATE	TYPE	VALUE	TIME
HYDRAZINE					
	ACGIH	1985	TLV	.1 PPM	8 HRS
	OSHA	1971	PEL	.1 PPM	8 HRS

FIRE AND EXPLOSION

FLASH POINT METHOD=
N/AP
AUTOIGNITION TEMP. METHOD=
N/AP
FLAMMABLE LIMITS (% VOLUME IN AIR)
LOWER: N/AP
UPPER: N/AP
FIRE AND EXPLOSION HAZARDS
SEE SUPPLEMENT
EXTINGUISHING MEDIA
DRY CHEMICAL
CO2
WATER SPRAY
UNIVERSAL TYPE FOAM
WATER FOG
SPECIAL FIREFIGHTING PROCEDURES
DO NOT ENTER FIRE AREA WITHOUT PROPER PROTECTION. SEE SECTION ON DECOMPOSITION PRODUCTS POSSIBLE. FIGHT FIRE FROM SAFE DISTANCE/PROTECTED LOCATION. WHEN IN CLOSE PROXIMITY TO FIRE, USE SELF-CONTAINED BREATHING APPARATUS. REFER TO SECTION V FOR OTHER PERSONAL PROTECTION RECOMMENDATIONS, IF ANY. NOTIFY AUTHORITIES IF LIQUID ENTERS SEWER/PUBLIC WATERS.

EALTH HAZARDS

ROUTES OF EXPOSURE
INHALATION -- PRIMARY ROUTE
OVEREXPOSURE MAY CAUSE COUGHING, SHORTNESS OF BREATH, DIZZINESS, INTOXICATION AND COLLAPSE.
EYE CONTACT -- PRIMARY ROUTE
MAY CAUSE SEVERE EYE IRRITATION.
SKIN ABSORPTION -- PRIMARY ROUTE
EXPOSURE TO THIS MATERIAL CAN RESULT IN ABSORPTION THROUGH SKIN CAUSING HEALTH HAZARD.
SKIN IRRITATION -- PRIMARY ROUTE
THIS MATERIAL HAS BEEN SHOWN TO BE A SEVERE SKIN IRRITANT AND AN ALLERGIC SENSITIZER
INGESTION -- PRIMARY ROUTE
SWALLOWING THIS MATERIAL MAY RESULT IN HEALTH HAZARD.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
THIS MATERIAL OR ITS EMISSIONS MAY AFFECT PREGNANCY AND/OR FETAL DEVELOPMENT.

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PROTECTIVE EQUIPMENT / CONTROL MEASURES

RESPIRATORY PROTECTION
IF EXPOSURE CAN EXCEED THE PEL/TLV, USE ONLY NIOSH/MSHA APPROVED AIR-PURIFYING OR SUPPLIED AIR RESPIRATOR OPERATED IN A POSITIVE PRESSURE MODE.

EYE PROTECTION
EYE PROTECTION, INCLUDING BOTH CHEMICAL SPLASH GOGGLES AND FACE SHIELD, MUST BE WORN WHEN POSSIBILITY EXISTS FOR EYE CONTACT DUE TO SPRAYING LIQUID OR AIRBORNE PARTICLES. CONTACT LENSES MUST NOT BE WORN.

SKIN PROTECTION
IMPERVIOUS PROTECTIVE SUIT WITH GLOVES, BOOTS, AND FULL HEAD AND FACE PROTECTION MUST BE WORN. THE EQUIPMENT MUST BE CLEANED THOROUGHLY AFTER EACH USE.

ENGINEERING CONTROLS
BOTH LOCAL EXHAUST AND GENERAL ROOM VENTILATION ARE USUALLY REQUIRED TO MEET EXPOSURE STANDARD(S).

OTHER HYGENIC PRACTICES
EMERGENCY EYE WASH FOUNTAINS AND SAFETY SHOWERS SHOULD BE AVAILABLE IN THE IMMEDIATE VICINITY OF ANY POTENTIAL EXPOSURE.

OTHER WORK PRACTICES
USE GOOD PERSONAL HYGIENE PRACTICES. WASH HANDS BEFORE EATING, DRINKING, SMOKING, OR USING TOILET FACILITIES. PROMPTLY REMOVE SOILED CLOTHING/WASH THOROUGHLY BEFORE REUSE. SHOWER AFTER WORK USING PLENTY OF SOAP AND WATER.

- EMERGENCY AND FIRST AID

INHALATION
IF OVERCOME BY EXPOSURE, REMOVE VICTIM TO FRESH AIR IMMEDIATELY. GIVE OXYGEN OR ARTIFICIAL RESPIRATION AS NEEDED. OBTAIN EMERGENCY MEDICAL ATTENTION. PROMPT ACTION IS ESSENTIAL.

EYE CONTACT
IN CASE OF EYE CONTACT, IMMEDIATELY RINSE WITH CLEAN WATER FOR 20-30 MINUTES. RETRACT EYELIDS OFTEN. OBTAIN EMERGENCY MEDICAL ATTENTION.

SKIN CONTACT
IMMEDIATELY REMOVE CONTAMINATED CLOTHING. WASH SKIN THOROUGHLY WITH MILD SOAP/WATER. FLUSH WITH LUKEWARM WATER FOR 15 MINUTES. IF STICKY, USE WATER-LESS CLEANER FIRST. OBTAIN EMERGENCY MEDICAL ATTENTION.

INGESTION
IF SWALLOWED, GIVE LUKEWARM WATER OR MILK (PINT) IF VICTIM COMPLETELY CONSCIOUS/ALERT. DO NOT INDUCE VOMITING BECAUSE OF CORROSIVE EFFECTS. OBTAIN EMERGENCY MEDICAL ATTENTION.

EMERGENCY MEDICAL TREATMENT PROCEDURES
MAINTAIN AIRWAY. IF PATIENT IS CYANOTIC, PROVIDE ARTIFICIAL VENTILATION/OXYGEN IMMEDIATELY. CPR MAY BE INDICATED.
IF SWALLOWED, DO NOT INDUCE VOMITING. GASTRIC LAVAGE AND CATHARTIC INDICATED.

- SPILL AND DISPOSAL

PRECAUTIONS IF MATERIAL IS SPILLED OR RELEASED
POTENTIAL ENVIRONMENTAL HAZARD. PREVENT FLOW TO SEWERS/PUBLIC WATERS. IMPOUND/RECOVER LARGE LAND SPILL; SOAK UP SMALL SPILL. ON WATER, MAY BIODEGRADE. CONTAIN/MINIMIZE DISPERSION/COLLECT. REPORT PER REGULATORY REQUIREMENTS.

WASTE DISPOSAL METHODS
SEE SUPPLEMENT

- ADDITIONAL PRECAUTIONS

HANDLING AND STORAGE PROCEDURES
SEE SUPPLEMENT

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- ADDITIONAL PRECAUTIONS (continued)

DECONTAMINATION PROCEDURES
ISOLATE, VENT, DRAIN, WASH, AND PURGE EQUIPMENT BEFORE MAINTENANCE. REMOVE ALL IGNITION SOURCES. CHECK ATMOSPHERE FOR EXPLOSIVENESS AND OXYGEN DEFICIENCIES. IF ANY RESIDUAL PRODUCT MAY BE PRESENT, TOTAL-ENCAPSULATING IMPERVIOUS PROTECTIVE SUITS, GLOVES, AND BOOTS SHOULD BE WORN. SEE PROTECTIVE EQUIPMENT ON PAGE 2 FOR PROPER RESPIRATORY PROTECTION.

2 - LABEL INFORMATION

USE STATEMENT
FOR INDUSTRIAL USE ONLY
KEEP OUT OF REACH OF CHILDREN
SIGNAL WORD
DANGER
PHYSICAL HAZARDS
CORROSIVE TO METALS
HEALTH HAZARDS
SEVERE SKIN AND EYE IRRITANT
INGESTION, INHALATION, AND SKIN CONTACT HAZARD
MAY CAUSE CANCER
MAY CAUSE LONG-TERM ADVERSE HEALTH EFFECTS
MAY CAUSE ALLERGIC REACTION
PRECAUTIONARY MEASURES
AVOID OXIDIZING AGENTS.
STORE IN TIGHTLY CLOSED CONTAINERS.
AVOID CONTACT WITH EYES, SKIN, AND CLOTHING.
AVOID PROLONGED OR REPEATED CONTACT WITH SKIN.
USE ONLY WITH ADEQUATE VENTILATION/PERSONAL PROTECTION.
PREVENT CONTACT WITH FOOD, CHEWING, OR SMOKING MATERIALS.
WASH THOROUGHLY AFTER HANDLING.
DO NOT TASTE/SWALLOW.
LIQUID PENETRATES LEATHER SHOES CAUSING DELAYED BURNS OR TOXIC EFFECTS.
DO NOT STORE IN MILD STEEL, ALUMINUM, BRASS OR ADMIRALTY.

- SUPPLEMENT

NOTE -- QUALIFIERS AND CODES USED IN THIS MSDS

EQ	= EQUAL	AP	= APPROXIMATELY
LT	= LESS THAN	GT	= GREATER THAN
TR	= TRACE	UK	= UNKNOWN
N/AP	= NOT APPLICABLE	N/P	= NO APPLICABLE INFORMATION FOUND
N/DA	= NO DATA AVAILABLE		

- DISCLAIMERS

SOME OF THE INFORMATION PRESENTED AND CONCLUSIONS DRAWN HEREIN ARE FROM SOURCES OTHER THAN DIRECT TEST DATA ON THE PRODUCT ITSELF.

THE INFORMATION IN THIS MSDS WAS OBTAINED FROM SOURCES WHICH WE BELIEVE ARE RELIABLE. HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, REGARDING ITS CORRECTNESS.

THE CONDITIONS OR METHODS OF HANDLING, STORAGE, USE AND DISPOSAL OF THE PRODUCT ARE BEYOND OUR CONTROL AND MAY BE BEYOND OUR KNOWLEDGE. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.

THIS MSDS WAS PREPARED AND IS TO BE USED ONLY FOR THIS PRODUCT. IF THE PRODUCT IS USED AS A COMPONENT IN ANOTHER PRODUCT, THIS MSDS INFORMATION

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A - DISCLAIMERS (continued)

MAY NOT BE APPLICABLE.

THIS MSDS HAS BEEN PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1200).

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Thompson Hayward

1. Ingestion

Repeated ingestion or the ingestion of large quantities may cause damage to the membranes of the mouth, throat, and gastro-intestinal tract which the material contacts. Burns of the mouth and throat, nausea, vomiting, cramps and diarrhea may occur. If untreated, tissue ulceration may result.

2. Eye Effects

Local irritation of the eyes may occur from contact with the powder, granules or aqueous solutions.

3. Dermal Effects

Skin contact with the powder or concentrated aqueous solutions may cause local irritaton

4. Inhalation

No health effects are known to occur from inhalation of monosodium phosphate. Inhalation of dusts, mists or sprays may result in nonspecific irritation of the upper respiratory tract.

5. Threshold Limit Value

No threshold limit value has been established by the American Conference of Governmental Industrial Hygienists.

6. Warning Properties

None.

VII. First Aid

First aid should be given immediately. Prompt treatment may greatly decrease the severity of the effect. In case of injury, the patient should be referred to a physician.

1. Ingestion

Give large amounts of water or warm salty water to induce vomiting. If this measure is unsuccessful, vomiting may be induced by tickling the back of the patient's throat with a finger. Vomiting should be encouraged until the vomitus is clear. Milk, eggs or olive oil may be given for their soothing effect after vomiting has been completed. Obtain medical attention if abdominal discomfort persists.

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2. Eye Contact

Immediately flush the eyes with large quantities of running water for a minimum of 15 minutes. Hold the eyelids apart during the irrigation to ensure flushing of the entire surface of the eye and lids with water. Do not attempt to neutralize with chemical agents. Obtain medical attention if irritation persists. Oils or ointments should not be used unless directed by a physician.

3. Skin Contact

Flush affected areas with water. Do not attempt to neutralize with chemical agents. Obtain medical attention if irritation persists.

4. Inhalation

Remove from contaminated atmosphere. If symptoms of respiratory discomfort persists, see a physician.

VIII. Precautions for Normal Use

A minor spill is defined as a small quantity which can be handled routinely considering the physical and hazardous properties of the product as well as the location of the spill.

The procedure to follow for minor spills is to sweep up the material, transfer to a container, and discard in the general dump. The residue may be washed away with water.

Spills which are not considered to be minor, which are considered to be an emergency, must be handled according to a predetermined plan. For assistance in developing such a plan, contact Stauffer's Technical Service Department.

IX. Recommended Safety Equipment

Dust mask
Goggles
Gloves, for continuous handling of the product.

X. Corrosivity to Materials of Construction

Neither mild steel nor brass is recommended for use with Monosodium Phosphate. Stainless steel is recommended.

XI. Storage Requirements

Storage in a cool, dry, ventilated area away from the direct rays of the sun is recommended. The containers should be well sealed.

XII. Disposal of Unused Material

For assistance in disposing of unused material contact Stauffer's Technical Service Department.

XIII. Disposal of Container

Residual quantities of material do not require special handling when disposing of empty containers. Empty containers may be incinerated or discarded with general trash.

XIV. References

Stauffer data.

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APPLICATIONS 6/7 AM

MATERIAL SAFETY DATA SHEET

ODUCT NAME: AQUA AMMONIA 26BE
ODUCT CODE: 16-05496-00

SECTION VII Spill and Leak Procedures CONTINUED
with large amount of water. Contain spill by diking.

Waste Disposal Method: Disposal of Ammonium Hydroxide or Aqua Ammonia may be subject to Federal, State and local regulations. Users of this product should review their operations in terms of applicable Federal, State and local laws and regulations, then consult with appropriate regulatory agencies before discharging. If disposed of as shipped, this material is a RCRA corrosive waste having a hazardous waste ID no. D002 (40 CFR 261.22).

CTION VIII D.O.T. Shipping Information

Proper Shipping Name:	AQUA AMMONIA SOLUTION (CONTAINING NOT LESS THAN 12% OR MORE THAN 44% AMMONIA)
Hazard Class:	CORROSIVE MATERIAL
ID Number:	NA2672
Label Requirements:	CORROSIVE
Other Information:	

TION IX Additional Information

This information may be of importance to you:

Under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, any environmental release of this chemical equal to or over the reportable quantity of 1000 lbs. must be reported promotly to the National Response Center, Washington, D.C. (1-800-424-8802). Any consumer product containing 5% or more ammonia requires a "POISON" label under FHSA (16 CFR 1500.129(1)).

********* E N D O F R E P O R T *********

NAME: EDWARD E. CHAPMAN DATE ISSUED: 11/12/1985
DATE REVISED:

< = LESS THAN N/A = NOT APPLICABLE UNK = UNKNOWN
> = MORE THAN N/D = NOT DETERMINED
N/E = NOT ESTABLISHED

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THOMPSON-HAYWARD CHEMICAL COMPANY
KANSAS CITY, KANSAS

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: AQUA AMMONIA 26BE
PRODUCT CODE: 16-05496-00
DATE: 12/11/85 PAGE 01

CAS # 001336-21-6

FORMULA: NH(4)OH/H(2)O

CHEMICAL FAMILY: Nitrogen Hydride

CHEMICAL NAME AND SYNONYMS: Ammonium Hydroxide
Ammonia aqueous
Ammonia solution

SUPPLIERS NAME: Thompson-Hayward Chemical Company
5200 Speaker Rd
Kansas City Ks 66106
SUPPLIERS PHONE NUMBER: 913-321-3131
TRANSPROTATION EMERGENCY PHONE NUMBER: 1-800-424-9300

SECTION I Hazardous Ingredients

Ingredient	Percent	TLV
Ammonia	29.4%	25 ppm TWA ACGIH 1984-1985

SECTION II Health Hazards

Threshold Limit Value: 25 ppm TWA (ACGIH 1984-1985) (Ammonia)

Effects of Overexposure:

Eyes: Corrosive. Eye contact may cause serious damage, including ulceration, perforation, scarring or blindness.

Skin: Local irritation, burns, blister formation.

Inhalation: Irritation, headache, coughing, severe lung congestion, breathing difficulty, convulsions and shock.

Ingestion: As with other corrosive alkalis, severe burning of gullet, stomach, mouth and throat. Possible death from shock or asphyxia LD(50): 350 mg/kg (rats)

First aid:

Eyes: CALL A PHYSICIAN AT ONCE! Irrigate the eyes immediately for 15 minutes and repeat for 5 minutes each 10 minutes for 1 hour. Hold eyelids apart to ensure flushing of the entire eye surface.

Skin: Remove contaminated clothing. Flush with water at least 15 minutes, DO NOT apply salves or ointments. Subsequent treatment is the same as for dermal burns. Launder clothing before reuse. CALL PHYSICIAN AT ONCE!

Inhalation: Wear respiratory protection as necessary and remove to fresh air at once! If breathing has stopped, give artificial respiration. If breathing with difficulty, give oxygen. CALL A PHYSICIAN AT ONCE!

Ingestion: DO NOT induce vomiting. Encourage the victim to

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CONTINUED ON PAGE 02

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KANSAS CITY, KANSAS

MATERIAL SAFETY DATA SHEET

RODUCT NAME: AQUA AMMONIA 26BE
RODUCT CODE: 16-05496-00

DATE: 12/11/85 PAGE 02

SECTION II Health Hazards CONTINUED

drink large amounts of water, substituting, as available, diluted vinegar, lemon juice, orange juice. Follow with a demulcent such as egg white, olive oil, milk, as available. CALL A PHYSICIAN AT ONCE!

Other Information:

VAPORS: Intense irritant and may produce severe tracheitis, bronchitis, and chemical pneumonia.

STRONG SOLUTION: Can cause tissue destruction on contact.

SHORT CONTACT WITH EYE: May cause serious eye damage.

SKIN CONTACT: Can vary from relatively mild dermatitis to severe burns, depending on solution strength, contact time, and sensitivity.

ALWAYS CALL A PHYSICIAN AT ONCE!

CTION III Special Protection Information

Respiratory Protection: Where required, use a respirator approved by NIOSH for ammonia.

Ventilation Required: Ventilation sufficient to ammonia maintain gas below 25 ppm TWA by volume in air. Rooms where ammonia might escape should have ventilation ducts leading to the outside.

Protective Equipment:

Eyes: Gas-tight chemical goggles or full length face shield protection when handling leaks or spills. NEVER WEAR CONTACT LENSES!!

Skin: Rubber or other protective gloves (gauntlets) should be worn where there is any danger of contact.

Additional Protective Measures:

Low Concentrations: Rubber coat, gloves, etc. may be sufficient.

High Concentrations: Complete acid suit.

TION IV Fire & Explosion Hazard Data

Flash Point (Method): N/A

Flammable Limits (% Volume in Air):

Upper: 25 for evolved ammonia

Lower: 16 for evolved ammonia

Extinguishing Media: Water

Special Fire Fighting Procedures: If involved in a fire from another

CONTINUED ON PAGE 03.

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THUMPSON-HAYWARD CHEMICAL COMPANY
KANSAS CITY, KANSAS

MATERIAL SAFETY DATA SHEET

SECTION IV Fire & Explosion Hazard Data CONTINUED

cause, a spray or fog of water is effective in removing the generated ammonia gas from the atmosphere. In above circumstances, firemen should use self-contained breathing apparatus. Keep containers cool with water stream and spray.

Unusual Fire and Explosion Hazards: Rapid addition to concentrated universal acids could create explosive conditions. In air ammonia gas is flammable at concentrations of 16-25% ammonia by volume. Such concentrations could occur if aqua ammonia is heated in a confined area which is not adequately ventilated. NH(3) increases the fire hazard from other combustible materials, including oil. Flammable limits are broadened by increasing temperature.

CTION V Physical Data

Boiling Point: 80 deg. F.

Specific Gravity (H(2)O=1): 0.897 @ 60 deg. F.

Vapor Pressure (MM HG.): 546 @ 20 deg. C.

Vapor Density (AIR=1): <1

Evaporation Rate (_____=1): N/A

Solubility in Water: Complete

Percent Volatile by Volume: 100% @ 212 deg. F.

pH: Unknown (11.6 for a normal solution)

Appearance and Odor: Colorless liquid; pungent odor (ammonia).

CTION VI Reactivity Data

Stability: Stable at room temperature. Aqua ammonia will react exothermically with acids. Releases ammonia vapor when heated.

Incompatibility: Avoid mixing with sulfuric acid or other strong mineral acids, hypochlorites (chlorine bleach), halogens, and/or sodium hydroxide. Avoid contact with iron, galvanized surfaces, copper, brass, bronze, aluminum alloys, mercury, gold, silver, or strong oxidizers. Avoid heating.

Hazardous Decomposition Products: Gaseous NH(3) (ammonia) on heating. When heated to decomposition, emits NH(3) (ammonia) and NO(x).

Hazardous Polymerization: Will not occur.

TION VII Spill and Leak Procedures

Steps to be taken if material is released or spilled: Wear respiratory protection and protective clothing. Stop source if possible. Stay upwind and use water to absorb the evolved gas. Dilute

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CONTINUED ON PAGE 04

THOMPSON-HAYWARD CHEMICAL COMPANY
KANSAS CITY, KANSAS

MATERIAL SAFETY DATA SHEET

RODUCT NAME: PHOS SODA DI ANHY GRAN 50#
RODUCT CODE: 16-20067-01

DATE: 10/09/87 PAGE 04

SECTION VIII D.O.T. Shipping Information

CONTINUED

ID Number: NONE

Label Requirements: NONE

Reportable Quantity: NONE

Other Information:

CTION IX Additional Information

This information may be of importance to you:

NOTES:

a) Minimize skin contact. Wash with soap and water before eating, drinking, smoking or using toilet facilities.

b) Food grade-FDA GRAS list, permitted in food. USDA Permitted in meat.

c) Store in a dry area for product quality assurance.

NPCAHMIS 000E

********* E N D O F R E P O R T *********

NAME: EDWARD E. CHAPMAN

DATE ISSUED: 10/31/1985
DATE REVISED: 08/24/1987

< = LESS THAN
> = MORE THAN

N/A = NOT APPLICABLE
N/D = NOT DETERMINED
N/E = NOT ESTABLISHED

UNK = UNKNOWN

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THOMPSON-HAYWARD CHEMICAL COMPANY
KANSAS CITY, KANSAS

MATERIAL SAFETY DATA SHEET

ODUCT NAME: PHOS SODA DI ANHY GRAN 50#
ODUCT CODE: 16-20067-01 DATE: 10/09/87 PAGE 01

CAS # 007558-79-4

FORMULA: Na(2)HPO(4)

CHEMICAL FAMILY: Phosphates

CHEMICAL NAME AND SYNONYMS: Disodium Phosphate; Disodium Orthophosphate; Sodium Phosphate Dibasic; DSP; Disodium Hydrogen Phosphate.

SUPPLIERS NAME: Thompson-Hayward Chemical Company
5200 Speaker Rd
Kansas City Ks 66106
SUPPLIERS PHONE NUMBER: 913-321-3131
TRANSPROTATION EMERGENCY PHONE NUMBER: 1-800-424-9300

CTION I Hazardous Ingredients

Ingredient	Percent	TLV
Disodium Phosphate	100%	TLV NUISANCE DUST PEL TWA 8 hr. 15 mg/m(3) Total Dust 5 mg/m(3) Respirable Dust OSHA TLV TWA 8 hr. 10 mg/m(3) Total Dust ACGIH 86/87

CTION II Health Hazards

Threshold Limit Value: As indicated SEC. I

Potential Effects of Exposure:

Eyes: May cause irritation & watering. Mild irritant to unwashed eyes, non-irritating to washed eyes indicated in industry studies of the rabbit.

Skin: Slight irritation. (RTECS '81-'82)

Inhalation: Inhalation of high airborne concentrations of dusts or mists may result in nonspecific irritation of upper respiratory tract. May cause sneezing.

Ingestion: Ingestion of large quantities may cause symptoms of gastrointestinal irritation.

First aid:

Eyes: Flush with water for 15 minutes while holding eyelids open. Get medical attention if irritation persists.

Skin: Wash off with water. If clothing contaminated, clean before reuse.

Inhalation: Remove to dust-free air.

Ingestion: Rinse mouth, and dilute stomach contents with water or preferably milk if available. Consult with a physician.

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CONTINUED ON PAGE 02

THOMPSON-HAYWARD CHEMICAL COMPANY
KANSAS CITY, KANSAS

MATERIAL SAFETY DATA SHEET

SECTION II Health Hazards
Other Information: CONTINUED

Notes to Physician:

Ingestion of large dose (e.g. 20 g) may cause nausea and vomiting. If vomiting is not spontaneous. Induction is usually not necessary as phosphates are laxatives. Symptomatic and supportive treatment is recommended.

CTION III Special Protection Information

Respiratory Protection: Use NIOSH approved equipment suitable for nuisance dusts when airborne exposure is excessive. Consult respirator manufacturer to determine appropriate type equipment for given application.

Ventilation Required: Provide ventilation to minimize exposure. Local exhaust ventilation preferred if dust created in confined quarters.

Protective Clothing:

Eyes: Use chemical safety glasses, goggles, or face shield selected with regard to use condition exposure potential.

Skin: Wear protective gloves to minimize skin contact.

Additional Protective Measures: Safety shower, eye bath and washing facilities should be available.

TION IV Fire & Explosion Hazard Data

Flash Point (Method): Non-flammable

Flammable Limits (% Volume in Air):

Upper: Non-flammable

Lower: Non-flammable

Extinguishing Media: N/A

Special Fire Fighting Procedures: N/A

Unusual Fire and Explosion Hazards: N/A

ION V Physical Data

Boiling Point: N/A

Melting Point: Water Loss @ 356 deg. F.

Specific Gravity (H(2)O=1): N/D

Vapor Pressure (MM HG.): Non-volatile

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APPLICATIONS TEAM

CONTINUED ON PAGE 03

THOMPSON-HAYWARD CHEMICAL COMPANY
KANSAS CITY, KANSAS

MATERIAL SAFETY DATA SHEET

SECTION V Physical Data

CONTINUED

Vapor Density (AIR=1): Non-volatile

Bulk Density: Granular 52-57 lbs/cu. ft.
Powder 49-52 lbs/cu. ft.

Evaporation Rate (____=1): N/A

Solubility in Water: 11.5% at 77 deg. F

Percent Volatile by Volume: Non-volatile

pH: 1% solution at 77 deg. F-9.0

Appearance and Odor: White granules or powder; odorless

CTION VI Reactivity Data

Stability: Stable

Incompatibility: None

Hazardous Decomposition Products: None

Hazardous Polymerization: Will not occur.

TION VII Spill and Leak Procedures

Steps to be taken if material is released or spilled: Sweep, scoop or vacuum up all spilled material, contaminated soil and other contaminated material and place in containers. If possible, complete cleanup on a dry basis. After all practical dry cleanup has been done, residual contamination can be flushed with plenty of water.

Waste Disposal Method:

Dispose of in an approved disposal facility in accordance with all local, state, federal regulations.

Sodium phosphate, dibasic, as currently defined, is a hazardous substance in the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (Superfund) and in the current federal regulations 40 CFR, Part 116 (Section 311, Clean Water Act) with a reportable quantity of 5,000 pounds if spilled into navigable waters. Since federal, state and local laws may vary, consult your attorney or appropriate regulatory officials for information relating to spill reporting.

TION VIII D.O.T. Shipping Information

Proper Shipping Name: NONE

Hazard Class: NONE

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CONTINUED ON PAGE 04

Hooker Industrial chemicals DIVISION

ADAPTED FROM USDL FORM NO. LSD - 003-A

MATERIAL SAFETY DATA SHEET

4

HFPA Designation

CHEMICAL NAME: Trisodium Phosphate, Crystalline	PLANT CODE	MATERIAL CODE
MANUFACTURER'S NAME: Hooker Chemical Corporation	EMERGENCY TELEPHONE NO. (716) - 285-6655	
ADDRESS: (NUMBER, STREET, CITY, STATE AND ZIP CODE) Niagara Falls, New York 14302		
CHEMICAL NAME AND SYNONYMS: Trisodium Orthophosphate	TRADE NAME: TSP - Crystal	
CHEMICAL FORMULA: $Na_3PO_4 \cdot 12H_2O$	MOL. WT. 380.16	USES: Soaps, detergents, water treating compounds

Physical Properties

BOILING POINT (°F) (-11 H_2O)	212°	SPECIFIC GRAVITY (H_2O=1) (Bulk Density)	0.8-0.9
VAPOR PRESSURE (mmHg)	--	PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)	--	EVAPORATION RATE (=1)	
SOLUBILITY IN WATER (cold)	22%		

APPEARANCE AND ODOR: Odorless, white, free flowing granular solid.

Fire and Explosion Hazard Data

FLASH POINT: None °F	METHOD	FLAMMABLE LIMITS: UEL -- LEL --	AUTOIGNITION TEMP.: None °F

EXTINGUISHING MEDIA: Not combustible.

SPECIAL FIRE FIGHTING PROCEDURES: As appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Solutions highly alkaline; can react with aluminum liberating flammable hydrogen; also irritating to skin and eyes.

Reactivity

INCOMPATIBILITY: Reacts with strong acids liberating heat. Water solutions react with aluminum liberating hydrogen.

HAZARDOUS DECOMPOSITION PRODUCTS: Heating to decomposition liberates oxides of phosphorus.

CONDITIONS TO AVOID: Contact with strong acids. Contact of water solutions with aluminum. Avoid personal contact with either crystals or solutions.

Hooker Industrial chemicals DIVISION

ADAPTED FROM USDL
FORM NO. LSD - 003-4

MATERIAL SAFETY DATA SHEET

4

HFPA Designati

CHEMICAL NAME: Trisodium Phosphate, Crystalline	PLANT CODE	MATERIAL CODE
MANUFACTURER'S NAME: Hooker Chemical Corporation	EMERGENCY TELEPHONE NO. (716) - 285-6655	
ADDRESS: (NUMBER, STREET, CITY, STATE AND ZIP CODE) Niagara Falls, New York 14302		
CHEMICAL NAME AND SYNONYMS: Trisodium Orthophosphate	TRADE NAME: TSP - Crystal	
CHEMICAL FORMULA: $Na_3PO_4 \cdot 12H_2O$	MOL. WT.: 380.16	USES: Soaps, detergents, water treating compounds

Physical Properties

BOILING POINT (°F) (-11 H_2O)	212°	SPECIFIC GRAVITY (H_2O=1) (Bulk Density)	0.8-0.9
VAPOR PRESSURE (mmHg)	--	PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)	--	EVAPORATION RATE (=1)	
SOLUBILITY IN WATER (cold)	22%		

APPEARANCE AND ODOR: Odorless, white, free flowing granular solid.

Fire and Explosion Hazard Data

FLASH POINT: None °F	METHOD	FLAMMABLE LIMITS: UEL -- LEL --
AUTOIGNITION TEMP.: None °F		

EXTINGUISHING MEDIA: Not combustible.

SPECIAL FIRE FIGHTING PROCEDURES: As appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Solutions highly alkaline; can react with aluminum liberating flammable hydrogen; also irritating to skin and eyes.

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Reactivity

INCOMPATIBILITY: Reacts with strong acids liberating heat. Water solutions react with aluminum liberating hydrogen.

HAZARDOUS DECOMPOSITION PRODUCTS: Heating to decomposition liberates oxides of phosphorus.

CONDITIONS TO AVOID: Contact with strong acids. Contact of water solutions with aluminum. Avoid personal contact with either crystals or solutions.

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Health Related Data

THRESHOLD LIMIT VALUE Not specified.

EFFECTS OF OVEREXPOSURE (SKIN, EYE, INHALATION, ETC.) Due to alkaline nature, acts as moder[illegible] irritant to skin, eyes and mucous membranes.

EMERGENCY AND FIRST AID PROCEDURES

EYES: Flush with large amount of water.

SKIN: Wash with soap and water.

INGESTION: Dilute by drinking large amount of water.

SPECIAL MEDICAL PROCEDURES Not usually required.

Special Protection Information

VENTILATION General room ventilation.

RESPIRATORY (TYPE) Mist protection where appropriate.

GLOVES (TYPE) Rubber, neoprene or vinyl.

EYE (TYPE) Chemical safety goggles.

OTHER

SPECIAL PRECAUTIONS FOR HANDLING AND STORAGE Store in clean, dry area separate from strong acids. Avoid aluminum in handling solutions.

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STEPS TO TAKE IN EVENT OF SPILL OR RELEASE Solid - shovel into containers for reclaim or transfer to disposal area. Solutions - contain by diking; if material enters sewer, dilute with large amount of water. Finally, flush spill area with water.

WASTE DISPOSAL Bury as landfill in disposal area; or treat solutions with lime, burying resulting sludge in landfill area.

REMARKS

REFERENCES Hooker Chemical Corporation Product Data Sheet No. 909: Trisodium Phosphate, Crystalline.

The information presented herein, while not guaranteed, was prepared by technically qualified personnel and to the best of our knowledge is true and accurate. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other or additional considerations.

NAME George W. Darling

LOC. Niagara-ICD

DATE March 1972

Health Related Data

...SHOLD LIMIT VALUE Not specified.

EFFECTS OF OVEREXPOSURE (SKIN, EYE, INHALATION ETC.) Due to alkaline nature, acts as moder- irritant to skin, eyes and mucous membranes.

EMERGENCY AND FIRST AID PROCEDURES

EYES: Flush with large amount of water.

SKIN: Wash with soap and water.

INGESTION: Dilute by drinking large amount of water.

SPECIAL MEDICAL PROCEDURES Not usually required.

Special Protection Information

VENTILATION General room ventilation.

RESPIRATORY (TYPE) Mist protection where appropriate.

GLOVES (TYPE) Rubber, neoprene or vinyl.

EYE (TYPE) Chemical safety goggles.

OTHER

SPECIAL PRECAUTIONS FOR HANDLING AND STORAGE Store in clean, dry area separate from strong acids. Avoid aluminum in handling solutions.

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APPLICATIONS TEAM

STEPS TO TAKE IN EVENT OF SPILL OR RELEASE Solid - shovel into containers for reclaim or transfer to disposal area. Solutions - contain by diking; if material enters sewer, dilute with large amount of water. Finally, flush spill area with water.

WASTE DISPOSAL Bury as landfill in disposal area; or treat solutions with lime, burying resulting sludge in landfill area.

REMARKS

REFERENCES Hooker Chemical Corporation Product Data Sheet No. 909; Trisodium Phosphate, Crystalline.

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NAME George W. Darling

LOC. Niagara-ICD

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