APPENDIX C
ROUTINE WETLAND DETERMINATION DATA FORMS

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project Site: South Harper Peaking Facility	Date: 8/19/2004
Applicant/Owner: Aquila	County: Cass
Investigator: Brad Guhr	State: MO

Do Normal Circumstances exist on the site	Yes	Community ID: PEM/PSS (W1)
Is the site significantly disturbed (Atypical Situation)	No	Transect ID: Wetland point
Is the area a potential Problem Area	No	Plot ID: SP1
(If needed, explain on reverse.		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Rumex crispus	H	FAC+	9.		
2. Salix nigra	S	OBL	10.		
3. Iva annua	H	FAC	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks: Amaranthus sp., Sagittaria latifolia, Eleocharis erythropoda, and Scirpus atrovirens also present

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: -- (in.)

Depth to Free Water in Pit: 5 (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: Pond inside this wetland is visible on aerial photography.

SOILS

Map Unit Name
(Series and Phase): Oska silty clay loam

Drainage Class: well drained

Field Observations
Confirm Mapped Type? Yes

Taxonomy (Subgroup): Typic Argiudolls

Profile Descriptions:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8		10 YR 3/2	7.5 YR 3/4	5%	silty clay loam
8-16		10 YR 3/1	7.5 YR 3/4	10%	silty clay loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (Explain in Remarks)

Remarks: Redoximorphic features are present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Remarks: Fringe wetland around a small constructed pond.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project Site: South Harper Peaking Facility	Date: 8/19/2004
Applicant/Owner: Aquila	County: Cass
Investigator: Brad Guhr	State: MO

Do Normal Circumstances exist on the site	Yes	Community ID: Pasture
Is the site significantly disturbed (Atypical Situation)	No	Transect ID: Upland point
Is the area a potential Problem Area	No	Plot ID: SP2
(If needed, explain on reverse.		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Bromus inermis	H	UPL	9.		
2. Festuca elatior	H	FACU+	10.		
3. Solanum carolinense	H	FACU-	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 0%

Remarks: Grazed pasture land.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☑ No Recorded Data Available

Field Observations:

Depth of Surface Water: -- (in.)

Depth to Free Water in Pit: -- (in.)

Depth to Saturated Soil: -- (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): Oska silty clay loam

Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Typic Argiudolls

Confirm Mapped Type? Yes

Profile Descriptions:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10 YR 3/2			silty clay loam

Hydric Soil Indicators:

- ☐ *Histosol*
- ☐ Histic Epipedon
- ☐ *Sulfidic Odor*
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Color:
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ *Organic Streaking in Sandy Soils*
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	No
Wetland Hydrology Present?	No
Hydric Soils Present?	No

Is this Sampling Point Within a Wetland? No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project Site: South Harper Peaking Facility	Date: 8/19/2004
Applicant/Owner: Aquila	County: Cass
Investigator: Brad Guhr	State: MO
Do Normal Circumstances exist on the site: Yes	Community ID: PEM (W2)
Is the site significantly disturbed (Atypical Situation): No	Transect ID: Wetland point
Is the area a potential Problem Area: No	Plot ID: SP3
(If needed, explain on reverse.	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Sagittaria latifolia	H	OBL	9.		
2. Ambrosia trifida	H	FAC+	10.		
3. Polygonum persicaria	H	FACW	11.		
4. Scirpus atrovirens	H	OBL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks: Wetland fringe along intermittent stream (Stream 1).

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water:	--	(in.)
Depth to Free Water in Pit:	4	(in.)
Depth to Saturated Soil:	0	(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: Stream is visible on aerial photography.

SOILS

Map Unit Name
(Series and Phase): Sampsel silty clay loam

Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Typic Argiaquolls

Confirm Mapped Type? Yes

Profile Descriptions:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6		10 YR 2/1			silty clay loam
6+					rock/cobble

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Hydric Soils List
- ☑ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes
Wetland Hydrology Present?	Yes
Hydric Soils Present?	Yes

Is this Sampling Point Within a Wetland? Yes

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project Site: South Harper Peaking Facility	Date: 8/19/2004
Applicant/Owner: Aquila	County: Cass
Investigator: Brad Guhr	State: MO
Do Normal Circumstances exist on the site: Yes	Community ID: Pasture
Is the site significantly disturbed (Atypical Situation): No	Transect ID: Upland point
Is the area a potential Problem Area: No	Plot ID: SP4
(If needed, explain on reverse.	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Trifolium pratense	H	FACU+	9.		
2. Vernonia baldwinii	H	FACW-	10.		
3. Solanum carolinense	H	FACU-	11.		
4. Festuca elatior	H	FACU+	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 25%

Remarks: Grazed pasture land.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☑ No Recorded Data Available

Field Observations:

Depth of Surface Water: -- (in.)

Depth to Free Water in Pit: -- (in.)

Depth to Saturated Soil: -- (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): Sampsel silty clay loam

Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Typic Argiaquolls

Confirm Mapped Type? Yes

Profile Descriptions:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10 YR 3/2			silty clay loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ *Sulfidic Odor*
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ *Organic Streaking in Sandy Soils*
- ☑ Listed on Local Hydric Soils List
- ☑ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	No
Wetland Hydrology Present?	No
Hydric Soils Present?	No

Is this Sampling Point Within a Wetland? No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project Site: South Harper Peaking Facility	Date: 8/19/2004
Applicant/Owner: Aquila	County: Cass
Investigator: Brad Guhr	State: MO
Do Normal Circumstances exist on the site: Yes	Community ID: PEM (W4)
Is the site significantly disturbed (Atypical Situation): No	Transect ID: Wetland point
Is the area a potential Problem Area: No	Plot ID: SP5
(If needed, explain on reverse.	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Polygonum persicaria	H	FACW	9.		
2. Echinochloa crus-galli	H	FACW	10.		
3. Spartina pectinata	H	FACW+	11.		
4. Rumex crispus	H	FAC+	12.		
5. Eleocharis erythropoda	H	OBL	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks: Wetland vegetation in depression along intermittent stream (Stream 1).

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: -- (in.)

Depth to Free Water in Pit: -- (in.)

Depth to Saturated Soil: 10 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☑ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: Stream is visible on aerial photography.

SOILS

Map Unit Name
(Series and Phase): Sampsel silty clay loam

Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Typic Argiaquolls

Confirm Mapped Type? Yes

Profile Descriptions:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3		10 YR 2/1			silty clay loam
3-16		10 YR 2/1	7.5 YR 3/4	5-8%	silty clay loam

Hydric Soil Indicators:

- ☐ *Histosol*
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Hydric Soils List
- ☑ Listed on National Hydric Soils List
- ☑ Other (Explain in Remarks)

Remarks: Redoximorphic features are present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project Site: South Harper Peaking Facility	Date: 8/19/2004
Applicant/Owner: Aquila	County: Cass
Investigator: Brad Guhr	State: MO

Do Normal Circumstances exist on the site	Yes	Community ID: Pasture
Is the site significantly disturbed (Atypical Situation)	No	Transect ID: Upland point
Is the area a potential Problem Area	No	Plot ID: SP6
(If needed, explain on reverse.		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Festuca elatior	H	FACU	9.		
2. Trifolium repens	H	FACU+	10.		
3. Solanum carolinense	H	FACU-	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 0%

Remarks: Grazed pasture land.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☑ No Recorded Data Available

Field Observations:

Depth of Surface Water: -- (in.)

Depth to Free Water in Pit: -- (in.)

Depth to Saturated Soil: -- (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): Sampsel silty clay loam

Drainage Class: poorly drained

Field Observations
Confirm Mapped Type? Yes

Taxonomy (Subgroup): Typic Argiaquolls

Profile Descriptions:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10 YR 3/2			silty clay loam

Hydric Soil Indicators:

- ☐ *Histosol*
- ☐ Histic Epipedon
- ☐ *Sulfidic Odor*
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ *Concretions*
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ *Organic Streaking in Sandy Soils*
- ☑ Listed on Local Hydric Soils List
- ☑ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	No
Wetland Hydrology Present?	No
Hydric Soils Present?	No

Is this Sampling Point Within a Wetland? No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project Site: South Harper Peaking Facility	Date: 8/19/2004
Applicant/Owner: Aquila	County: Cass
Investigator: Brad Guhr	State: MO

Do Normal Circumstances exist on the site	Yes	Community ID: PEM (W4)
Is the site significantly disturbed (Atypical Situation)	No	Transect ID: Wetland point
Is the area a potential Problem Area	No	Plot ID: SP7
(If needed, explain on reverse.		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Polygonum persicaria	H	FACW	9.		
2. Trifolium repens	H	FACU+	10.		
3. Echinochloa crus-galli	H	FACW	11.		
4. Spartina pectinata	H	FACW+	12.		
5. Ambrosia artemisiifolia	H	FACU	13.		
6. Rumex crispus	H	FAC+	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 67%

Remarks: Wetland vegetation in depression along intermittent stream (Stream 1). Trifolium pratense, Cyperus esculentus, Iva annua, and Ambrosia trifida also present.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: -- (in.)

Depth to Free Water in Pit: -- (in.)

Depth to Saturated Soil: 12 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: Stream is visible on aerial photography.

SOILS

Map Unit Name
(Series and Phase): Sampsel silty clay loam

Drainage Class: poorly drained

Field Observations
Confirm Mapped Type? Yes

Taxonomy (Subgroup): Typic Argiaquolls

Profile Descriptions:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6		10 YR 3/2	7.5 YR 3/4	3%	silty clay loam
6-16		10 YR 3/1	7.5 YR 3/4	5%	silty clay loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Hydric Soils List
- ☑ Listed on National Hydric Soils List
- ☑ Other (Explain in Remarks)

Remarks: Redoximorphic features are present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project Site: South Harper Peaking Facility	Date: 8/19/2004
Applicant/Owner: Aquila	County: Cass
Investigator: Brad Guhr	State: MO

Do Normal Circumstances exist on the site	Yes	Community ID: Pasture
Is the site significantly disturbed (Atypical Situation)	No	Transect ID: Upland point
Is the area a potential Problem Area	No	Plot ID: SP8
(If needed, explain on reverse.		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Ambrosia artemisiifolia	H	FACU	9.		
2. Festuca elatior	H	FACU	10.		
3. Trifolium pratense	H	FACU+	11.		
4. Trifolium repens	H	FACU+	12.		
5. Medicago lupulina	H	FAC-	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 0%

Remarks: Disturbance-tolerant pasture vegetation on berm of pond.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☑ No Recorded Data Available

Field Observations:

Depth of Surface Water: -- (in.)

Depth to Free Water in Pit: -- (in.)

Depth to Saturated Soil: -- (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): Sampsel silty clay loam

Drainage Class: poorly drained

Field Observations
Confirm Mapped Type? Yes

Taxonomy (Subgroup): Typic Argiaquolls

Profile Descriptions:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10 YR 3/2			silty clay loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Hydric Soils List
- ☑ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	No
Wetland Hydrology Present?	No
Hydric Soils Present?	No

Is this Sampling Point Within a Wetland? No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project Site: South Harper Peaking Facility		Date:	8/19/2004
Applicant/Owner: Aquila		County:	Cass
Investigator: Brad Guhr		State:	MO
Do Normal Circumstances exist on the site	Yes	Community ID:	PEM (W5)
Is the site significantly disturbed (Atypical Situation)	No	Transect ID:	Wetland point
Is the area a potential Problem Area	No	Plot ID:	SP9
(If needed, explain on reverse.			

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Polygonum persicaria	H	FACW	9.		
2. Eleocharis erythropoda	H	OBL	10.		
3. Cyperus esculentus	H	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks: Slight depression in field where ponding appears to occur on occasion along intermittent stream (Stream 1).

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: -- (in.)

Depth to Free Water in Pit: -- (in.)

Depth to Saturated Soil: 12 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: Stream is visible on aerial photography.

SOILS

Map Unit Name
(Series and Phase): Sampsel silty clay loam

Drainage Class: poorly drained

Field Observations
Confirm Mapped Type? Yes

Taxonomy (Subgroup): Typic Argiaquolls

Profile Descriptions:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8		10 YR 3/1	10 YR 3/6	5%	silty clay loam
8-16		10 YR 3/1	10 YR 3/6	10%	silty clay loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Hydric Soils List
- ☑ Listed on National Hydric Soils List
- ☑ Other (Explain in Remarks)

Remarks: Redoximorphic features are present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes
Wetland Hydrology Present?	Yes
Hydric Soils Present?	Yes

Is this Sampling Point Within a Wetland? Yes

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project Site: South Harper Peaking Facility	Date: 8/19/2004
Applicant/Owner: Aquila	County: Cass
Investigator: Brad Guhr	State: MO

Do Normal Circumstances exist on the site	Yes	Community ID: Pasture
Is the site significantly disturbed (Atypical Situation)	No	Transect ID: Upland point
Is the area a potential Problem Area	No	Plot ID: SP10
(If needed, explain on reverse.		

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Festuca elatior	H	FACU	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 0%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☑ No Recorded Data Available

Field Observations:

Depth of Surface Water: -- (in.)

Depth to Free Water in Pit: -- (in.)

Depth to Saturated Soil: -- (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): Sampsel silty clay loam

Drainage Class: poorly drained

Field Observations
Confirm Mapped Type? Yes

Taxonomy (Subgroup): Typic Argiaquolls

Profile Descriptions:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6		10 YR 3/2			silty clay loam
6-16		10 YR 3/2	7.5 YR 3/4	3-5%	silty clay loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Color:
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Hydric Soils List
- ☑ Listed on National Hydric Soils List
- ☑ Other (Explain in Remarks)

Remarks: Redoximorphic features are present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	No
Wetland Hydrology Present?	No
Hydric Soils Present?	Yes

Is this Sampling Point Within a Wetland? No

Remarks:

2.4 Threatened & Endangered Species Survey/Concurrences

Burns & McDonnell
SINCE 1898

10-28-04 2:49 2:46 p.m.

OPTIONAL FORM 99 (7-90) FAX TRANSMITTAL # of pages ▶ 3
To Brad Guhr From Ellie
Dept./Agency Wetland Scientist Phone # 573-234-2132 X100
Fax # 816-~~333-3640~~ 822-3565 Fax # 573-234-2181
NSN 7540-01-317-7368 GENERAL SERVICES ADMINISTRATION

September 2, 2004

Mr. Charlie Scott
Field Supervisor
U.S. Fish and Wildlife Service
Missouri Ecological Services Office
101 Park DeVille Drive, Suite A
Columbia, MO 65203-0007

FILE

REC'D SEP 15 2004

South Harper Peaking Facility
Request for Agency Concurrence
Project No.: 37273

Dear Mr. Scott:

Burns & McDonnell Engineering, Inc. (Burns & McDonnell) has been retained by Aquila Inc. (Aquila) to obtain the necessary environmental permits and/or clearances for the proposed South Harper Peaking Facility approximately two miles southwest of Peculiar in Cass County, Missouri (Figure 1; Appendix A). Aquila proposes to construct, own, and operate a new, nominal 315 MW peaking power generation facility. The South Harper Peaking Facility (Project) will consist of three simple-cycle, natural gas combustion turbine generators to meet the increasing power consumption requirements in the northwest Missouri Region. As a peaking power facility, the Project is expected to operate no more than 6,000 hours per year, primarily on warm summer days when the demand for electrical power is the highest.

The Project will be constructed on a parcel of land approximately 73 acres in size; however, the actual land disturbance is anticipated to be only about 38 acres, including the Project footprint and temporary construction areas. The 73-acre site is located in the southeast quarter (SE¼) of the southeast quarter (SE¼) of Section 29, and the northeast quarter (NE¼) of the northeast quarter (NE¼) of Section 32, Township 45 North, Range 32 West. An existing 69-kV electrical transmission line owned by Aquila intersects the Project site and will allow for interconnection to the electric grid. An existing 20-inch natural gas pipeline, owned by Southern Star Pipeline Company, also intersects the Project site and will be used for the fuel supply. Construction of the Project is expected to begin in the fall of 2004 and will be completed by summer 2005.

The proposed Project site was visited on August 19th and 20th, 2004 to assess the projects potential to impact threatened and endangered species. Prior to the site visit, available information for Cass County was obtained from the U.S. Fish and Wildlife Service (FWS) and Missouri Department of Conservation (MDC) Internet web sites.

9400 Ward Parkway
Kansas City, Missouri 64114-3319
Tel: 816 333-9400
Fax: 816 333 3690

Other sources of site information included the 1994 USGS topographic map for the Peculiar Quadrangle, 1954 (Photo-Revised 1981), the U.S. Department of Agriculture Soil Survey for Cass County, Missouri, and aerial photographs of the project site and surrounding area. According to the FWS and MDC, two protected species are known or are likely to occur in Cass County.

Protected Species Known or Likely to Occur in Cass County			
Common Name	**Scientific Name**	**State Status**	**Federal Status**
Mead's Milkweed	*Asclepias meadii*	Endangered	Threatened
Barn Owl	*Tyto alba*	Endangered	-
Based on information provided by the FWS http://midwest.fws.gov/Endangered/lists/missouri-cty.html and MDC Natural Heritage Database http://www.conservation.state.mo.us/cgi-bin/heritage/search.cgi?county=CASS			

Mead's milkweed prefers mesic to dry prairies, prairie hay meadows, and virgin mesic silt loam prairies. Barn owls forage in open grasslands or crop fields and nest in abandoned buildings, farm outbuildings, or cavity trees greater than 20 inches in diameter at breast height (dbh).

The proposed Project site consists mostly of open pasture (Figure 2) (Photograph 1; Appendix B). Vegetation at the Project site consists of non-native pasture grasses, primarily smooth brome (*Bromus inermis*) and tall fescue (*Festuca elatior*), and associated invasive, disturbance-tolerant forbs such as common milkweed (*Asclepias syriaca*), horse nettle (*Solanum carolinense*), field bindweed (*Convolvulus arvensis*), fire-on-the-mountain (*Euphorbia cyathophora*), foxtail (*Setaria* sp.), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), ironweed (*Vernonia baldwinii*), and daisy fleabane (*Erigeron strigosus*). Woody vegetation in the area is restricted to a few small clumps of trees and shrubs in drainages and depressions (Photograph 2). These areas include saplings and small trees of black willow ((*Salix nigra*), green ash (*Fraxinus pennsylvanica*), eastern cottonwood (*Populus deltoides*), osage orange (*Maclura pomifera*), honeylocust (*Gleditsia triacanthos*), and a shrub layer that consisted of roughleaf dogwood (*Cornus drummondii*) and buckbrush (*Symphoricarpos orbiculatus*).

Potential habitats for Mead's milkweed and barn owls were not observed at the proposed site. Tallgrass prairies and cavity trees greater than 20 dbh were not present. The site was dominated by grass pastures that appear to be regularly grazed (see site photos). Recent evidence of the presence of cattle was observed over the entire site. Raptor stick nests were not observed in any of the trees in the vicinity of the proposed project area. A number of livestock ponds were present along drainages in the project area (Photograph 3), but the large pond in the southern portion of the site (Figure 2) has been removed (Photograph 4).

Based on the site survey, Burns & McDonnell has concluded that construction and operation of the Project will not result in any significant impacts to threatened and endangered species or their critical habitats. Construction of the proposed facility will occur within previously disturbed agricultural lands, not impact any wetlands, and will not require any tree clearing.

We are seeking to gain your concurrence with our findings regarding construction of the proposed Project. Your assistance in identifying resource issues/concerns is appreciated and an expeditious response to this inquiry would be greatly appreciated. If you have any questions regarding this project, please contact me at (316) 283-4114 or by e-mail at bguhr@burnsmcd.com.

Sincerely,

Brad Guhr

Brad Guhr
Wetland Scientist

Encl.

cc: Block Andrews, Aquila;
John Stower, Burns & McDonnell
Files

"The U.S. Fish and Wildlife Service has reviewed the subject proposal and accompanying information and determined that the activity as described, is not likely to adversely affect federally listed species or designated critical habitat; consequently, this concludes section 7 consultation. Please contact the Missouri Department of Conservation (573/751-4115) for state listed species of concern." Rick L Hansen 4 Oct 2004

for the Field Supervisor Date

MISSOURI DEPARTMENT OF CONSERVATION

Headquarters

2901 West Truman Boulevard, P.O. Box 180, Jefferson City, Missouri 65102-0180

Telephone: 573/751-4115 ▲ Missouri Relay Center: 1-800-735-2966 (TDD)

JOHN D. HOSKINS, Director

September 23, 2004

Mr. Brad Guhr
9400 Ward Parkway
Kansas City, Missouri 64114-3319

Dear Mr. Guhr:

Thank you for your letter of September 2, 2004, regarding possible effects of your project on species of conservation concern. I hope the enclosed Heritage Review Report meets your needs. It provides a "snapshot" of what we know today about sensitive resources near your project site, ways a project like yours might affect them and any "best management" recommendations.

This report should also meet needs for compliance with various permitting processes designed to protect the environment. MDC is not authorized under federal law to give "clearance" or set requirements for project completion. Our role, developed over years of working with the agencies that have regulatory responsibility, is primarily to identify issues of concern and ways to minimize adverse impacts. Permitting agencies normally consider and sometimes rely on our suggestions as they set project conditions and requirements.

Incorporating information from our Heritage records into project plans can help reduce unnecessary impacts to Missouri's sensitive natural resources. However, our records are just one source. Other types of information, such as wetland maps, soils maps, surveys and on-site inspections should be considered. Ultimately, the project manager must compare reports like this to actual current conditions and act responsibly to comply with laws, regulations and permit conditions.

The format of this report is somewhat different than we have used in the past, and I hope it is an improvement. If you have any comments or concerns about the changes, or any other element of our approach to heritage review, please give me a call or e-mail me at Shannon.Cave@mdc.mo.gov.

Thank you for the opportunity to review and comment.

Sincerely,

SHANNON CAVE
PUBLIC INVOLVEMENT COORDINATOR

SDC:kf

Enclosure

Heritage Review Report

Mr. Brad Guhr
Burns & McDonnell
9400 Ward Parkway
Kansas City, Missouri 64114-3319

Project type: Power plant
Location: T45N R32W S29 & 32
County: Cass
Described in query as: South Harper Peaking Facility
Date query received: September 23, 2004

Missouri Department of Conservation
Attn: Shannon Cave
Public Involvement Coordinator
P. O. Box 180
Jefferson City, MO 65102
Shannon.Cave@mdc.mo.gov
573-522-4115 Ext. 3250

This is not a site clearance letter, but a report of Missouri Department of Conservation records concerning public lands and sensitive resources known to be near and possibly affected by the proposed project.

Species/habitats with Federal restrictions: No Records Found

Species/habitats with State restrictions: No Records Found

Concerns & management recommendations[1] based on site or project details, not related to specific heritage records:

Habitat loss can impact populations of grassland birds native to the area, including barn owls (state endangered), northern harriers (state endangered), Henslow's sparrow (imperiled in the state), and greater prairie-chickens (state endangered). Revegetation with native grasses and other flowering plants will minimize the impact of habitat disturbance. Best management practices may be found on-line at http://www.mdc.mo.gov/nathis/endangered/bmp.htm.

The project area occurs in a region of karst geology, characterized by subterranean water movement. Features like caves, springs, and sinkholes are common. Cave fauna are influenced by water pollution and other changes to water quality. Every effort should be made to protect groundwater in the project area. See http://www.mdc.mo.gov/documents/nathis/endangered/karst.pdf for best management information.

Some raptors, including far-ranging species that are endangered or threatened, are prone to electrocution because of their size, behavior, and perching habits, especially on power poles. By increasing the gap between ground wires and energized conductors to 4 feet, the risk of electrocution can be reduced. Wires and other metal equipment can also be insulated. Locating wooden perches well above energized wires, and installing guards for perches in dangerous areas, may also help avoid problems.

Prepared by _____ **Date** 9/23/2004

[1] Contact us for printed versions of best management practices, please.

A HERITAGE REVIEW requires a project description[2] and specific site location[3]. Based on that information, the review provides information about species and habitats of concern that could[4] be affected by the project. Three different kinds of information are provided.

- **"Species/Habitats With FEDERAL RESTRICTIONS"** lists species that have been known to exist near enough to the project site to warrant concern and protected under the Federal Endangered Species Act. For these, project managers must contact the U.S. Fish and Wildlife Service Ecological Services (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132; Fax 573-234-2181) for consultation.
- **"Species/habitats with STATE RESTRICTIONS"** lists species known to exist near enough to the project site to warrant concern and protected under the Wildlife Code of Missouri (RSMo 3 CSR 10). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR10-4.111. "State Rank" is numeric rank of relative rarity, protected under general provisions of the Wildlife Code.
- **"Concerns & management recommendations"** are things one might prudently look for at the identified site, but of which we have no specific record. With 93% of Missouri land in private ownership, most sites in Missouri have never been carefully inspected by conservation professionals, but our knowledge of the surrounding landscape suggests that the project consider these items.

With all of the above, we attempt to provide information to help the requestor determine if the species is actually on site, and available best management recommendations.

This report is not a site clearance letter. Rather, this letter provides an indication of whether or not public lands and sensitive resources are known to be (or are likely to be) located close to the proposed project.

Incorporating information from our Heritage Database into project plans is an important step that can help reduce unnecessary impacts to Missouri's sensitive natural resources. However, the Heritage Database is only one reference that should be used to evaluate potential adverse impacts. Other types of information, such as wetland and soils maps and on-site inspections or surveys, should be considered. Reviewing current landscape and habitat information and species biological characteristics would additionally ensure that species of conservation concern are appropriately identified and addressed.

Additional information on rare, endangered and watched species may be found at http://www.mdc.mo.gov/nathis/endangered/

---

[2] Please provide basic information but not great detail. Multi-page renderings are usually not needed, but a brief text description may mean fewer concerns will be raised. For example, if the project is to erect a cellular tower, nearby endangered mussels might not be noted even though they would be for a sewage lagoon.

[3] Preferred are (a) township/range/section description (UTM and lat/long take more time here, but will work) and (b) a topographic map with site marked (point or boundary as appropriate). In most cases an 8-1/2X11 photocopy of part of a USGS map is fine (note the quadrangle name); or a page print of an online map (e.g. www.topozone.com) with point marked. Extensive ongoing projects (e.g. oil pipelines) should if possible provide ARCGIS® shape files compatible with UTM15.

[4] Heritage records note things that were positively identified at some date and time, marked at a location that may be more or less precise. Animals move quickly but plant communities can move also. To say "there is a record" does not mean the species/habitat is still there. To say that "there is no record" does not mean the project may not encounter something. Because of this, reports include information about records near but not necessarily on the project site.

2.5 Noise Assessment Study

Noise Assessment Study

Aquila, Inc.
South Harper Peaking Facility
Peculiar, Missouri

October 2004

Aquila

Table of Contents

LIST OF TABLES

LIST OF FIGURES

1. Introduction

Burns & McDonnell has been contracted by Aquila, Inc. (Aquila) to conduct an environmental sound level assessment study for the South Harper Peaking Facility (Project). This proposed project will be a simple-cycle facility consisting of three Siemens-Westinghouse 501D5A combustion turbines. The existing land use in the vicinity of the project site can be characterized as a mixture of agricultural and residential use. The site consists of 73 acres, located on flat to rolling terrain, in Township 45N, Range 32W, Section 29 and 32 approximately three miles southwest of Peculiar on South Harper Road near 243rd Street. The nearest residences to the facility are located to the east and south of the site. The new combustion turbines will be housed in an enclosure designed with sound abatement features. The inlet air and exhaust sections of the combustion turbines will also have silencing equipment to minimize sound levels. The assumed stack attenuation package used in this evaluation is the Econopac for the 501D5A turbines

The objectives of this study are to conduct an ambient noise monitoring effort to measure the ambient sound levels in the vicinity of the proposed project site, quantify the sound emissions from the project, perform noise modeling to predict the project's projected sound levels at property boundary and on the closest sound receptors in the surrounding community, and compare those predicted sound levels to the identified applicable local noise ordinances.

2. Acoustical Terminology

The human response to sound is complex and is influenced by a variety of acoustic and non-acoustic factors. Acoustic factors generally include the sound's amplitude, duration, frequency content, and fluctuations. Non-acoustic factors typically include the listener's ability to become acclimated to the sound, the listener's attitude towards the noise and the noise source, the listener's interpretation of the necessity of the noise, and the predictability of the noise. As such, response to noise is highly individualized.

Amplitude and frequency physically characterize sound energy. Sound amplitude is measured in decibels (dB) as the logarithmic ratio of a sound pressure to a reference sound pressure (20 microPa). The reference sound pressure corresponds to the typical threshold of human hearing. A 3 dB change in a continuous broadband noise is generally considered "just barely perceptible"

to the average listener. Similarly, a 6 dB change is generally considered "clearly noticeable" and a 10 dB change is generally considered a doubling (or halving) of the apparent loudness.

Frequency is measured in Hertz (Hz), which is the number of cycles per second. The typical human ear can hear frequencies ranging from approximately 20 Hz to 20,000 Hz. Typically, the human ear is most sensitive to sounds in the middle frequencies (1,000 to 8,000 Hz) and is less sensitive to sounds in the low and high frequencies. As such, the A-weighting scale was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighting scale emphasizes sounds in the middle frequencies and de-emphasizes sounds in the low and high frequencies. Any sound level to which the A-weighting scale has been applied is expressed in A-weighted decibels, dBA. For reference, the A-weighted sound pressure level and subjective loudness associated with some common noise sources are listed in Table 2-1.

Another weighting scale is the C-weighting scale. The C-weighting scale simulates the human ear's response to relatively high frequency sound levels. At high frequency sound levels, the response of the human ear to different frequencies is relatively constant. The C-weighting scale generally applies to sound levels that are much higher than typical environmental sound levels. Nonetheless, the C-weighting scale can be useful in evaluating low-frequency sound levels. Excessive levels of low frequency noise, while not being readily perceptible to the human ear, can be sensed as airborne vibrations. These vibrations can be felt as much as they can be heard. In extreme cases, these vibrations may cause light frame structures to vibrate causing a noticeable vibration within residences. In general, low-frequency impacts to residences in the way of perceptible vibrations are minimized when the C-weighted sound pressure levels are at or below 75-80 dBC.

Table 2-1:
Typical Sound Pressure Levels Associated with Common Noise Sources

Sound Pressure Level (dBA)	Subjective Evaluation	Environment	
		Outdoor	Indoor
140	Deafening	Jet aircraft at 75 ft	
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 ft	
120	Threshold of feeling	Elevated train	Hard rock band
110		Jet flyover at 1000 ft	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 ft, auto horn at 10 ft, crowd noise at football game	
90		Propeller plane flyover at 1000 ft, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 mph) at 50 ft	Inside auto at high speed, garbage disposal, dishwasher
70	Loud	B-757 cabin during flight	Close conversation, vacuum cleaner, electric typewriter
60	Moderate	Air-conditioner condenser at 15 ft, near highway traffic	General office
50	Quiet		Private office
40		Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Bedroom, average residence (without t.v. and stereo)
20		Rustling leaves	Quiet theater, whisper
10	Just audible		Human breathing
0	Threshold of hearing		

Source: Adapted from Architectural Acoustics, M. David Egan, 1988 and Architectural Graphic Standards, Ramsey and Sleeper, 1994.

There are also objective factors to consider when determining the noise and how people may be affected by the noise. A noise spectrum that contains audible pure tones is typically more annoying than a spectrum with the same overall level but without the tones. It has been shown that when noise complaints were received from a power plant when registering noise levels

under 45 dBA, the noise had some tonal components. Low frequency sound may also affect people subjected to the noise. Pulsation may occur when the sound level is 75 to 80 dBC in the 31.5 Hz octave band at residential locations.

Noise in the environment is constantly fluctuating, such as when a car drives by, a dog barks, or a plane passes overhead. Therefore, noise metrics have been developed to quantify fluctuating environmental noise levels. These metrics include the exceedance sound levels. The exceedance sound level, L_x, is the sound level exceeded "x" percent of the sampling period and is referred to as a statistical sound level. The most common L_x values are L_{eq}, L_{90}, L_{50}, and L_{10}. L_{eq} is the level of a constant sound over a specific time period that has the same sound energy as the actual sound over the same period. L_{90} is the sound level exceeded 90 percent of the sampling period. L_{90} represents the sound level without the influence of loud, transient noise sources and is therefore often referred to as the residual or background sound level. L_{50} is the sound level exceeded 50 percent of the sampling period. L_{10} represents the occasional louder noises and is often referred to as the intrusive sound level. The variation between the L_{90}, L_{50}, and L_{10} sound levels can provide an indication of the variability of the acoustical environment. If the acoustical environment is perfectly steady, all values are identical. A large variation between the values indicates the environment experiences highly fluctuating sound levels. For instance, measurements near a roadway with frequent passing vehicles may cause a large variation in the statistical sound levels. This report examines L_{eq} values at nearby residences from the proposed project.

3. Applicable Regulations

Burns & McDonnell reviewed applicable noise regulations for the South Harper Peaking facility located within the city limits of Peculiar, Missouri. There is no noise ordinance for the City of Peculiar. The Federal Highway Administration (FHWA) has established noise impact criteria for different land uses close to highways. Some of the exterior criteria are illustrated below.

Table 3-1

Land Use	Leq (dBA)
Residential	**67**
Commercial	**72**

According to the FHWA policy, a noise receiver is considered impacted if the noise level approaches, equals, or exceeds the FHWA's limits listed in Table 3-1.

Aquila is proposing a self-imposed facility design limit of no more than 65 dBA Leq at the closest residence. According to the noise projections, and based on design criteria projections, equipment specifications, and measurements of existing sound levels, this limit will be met with all generation units and ancillary equipment running at full capacity.

4. Noise Measurement Methodology

On September 7 and 8, 2004, Burns & McDonnell personnel conducted ambient sound surveys to quantify existing background sound level measurements for three different time periods at various measurement locations around the proposed facility location. Weather conditions which can adversely impact this process were favorable for conducting ambient noise measurements during all measurement periods. According to American National Standard, ANSI B133.8-1977, "measurements should not be made when average wind velocity exceeds 7 mph. Cloudy or overcast, or nighttime conditions are preferred". During the morning readings (7 AM to 8 AM) skies were clear to partly cloudy, wind was, on the average, calm to three miles per hour (mph). Temperatures were around 55 degrees Fahrenheit and relative humidity was 73 percent. Afternoon measurements (12 PM to 1 PM) were taken when skies were clear, wind was, on an average, six mph at a temperature of 70 degrees Fahrenheit and relative humidity of 40 percent. During the evening readings (4:30 PM to 5:30 PM) skies were clear, wind was calm to seven mph, the temperature was 76 degrees Fahrenheit and relative humidity was 36 percent.

At each of the three periods when ambient noise was being monitored, sound level measurements were made at four locations around the proposed project site (Figure 4-1). Table 4-1 lists each measurement point and describes each location. The ambient noise monitoring locations were selected because they were accessible, and near sensitive noise receptors.

The nearest residence to the proposed project site is located to the east of the site adjacent to (MP1), approximately 950 feet from the project proposed turbine locations.

Table 4-1:
Noise Monitoring Point Locations

Monitoring Point	Location Description
MP1	Near residence east of the site at the intersection of East 243rd Street and South Harper Road
MP2	North of site near residence at 9812 East 241st Street
MP3	Northwest of site near residence at 9601 East 241st Street
MP4	Southeast of site on South Harper Road near residence

Project Site Area

Noise Receptors

N

Source: http://terraserver.microsoft.com, USGS Aerial 1997

Burns & McDonnell
SINCE 1898

Figure 4-1
Aerial Photograph
South Harper Peaking Facility

5. Background Noise Levels

Background noise measurements were measured at each of the four locations identified in Table 4-1. Measurements were made in decibels (dB) at 31.5, 63, 125, 250, 500, 1,000, 2,000, 4,000, and 8,000 Hertz (Hz) using a Larson-Davis model 824 sound analyzer. At each monitoring location, sound levels within the referenced frequency bands were measured and logged by the analyzer. Measurements were taken and accumulated until a stable sound level was reached, which usually required about two minutes. The average sound level L_{eq} for each monitoring period is recorded and the contribution of the frequency bands to the total sound level is customarily weighted to approximate the frequency sensitivity of human hearing. Some audible noises were observed during the background noise readings, and these extraneous noises are displayed in Table 5-1, along with the measured noise levels at each point during each measurement period.

Table 5-1:
Existing Background Sound Pressure Levels, dBA

Measurement Points Locations	Time Period	L_{eq} (dBA)	Extraneous Noises
MP1	Morning	44	Highway 71 traffic noise, Some bird noise
MP2	Morning	44	Dogs barking (minor disturbance)
MP3	Morning	41	Highway 71 traffic noise
MP4	Morning	42	Some highway traffic noise
MP1	Afternoon	55	Insect noise
MP2	Afternoon	51	Insect and bird noise
MP3	Afternoon	49	Insect and bird noise, some traffic noise
MP4	Afternoon	50	Highway 71 traffic noise and some bird noise
MP1	Evening	54	Insect noise
MP2	Evening	54	Insect noise and rustling leaves
MP3	Evening	51	Insect noise, distant circular saw and backhoe sounds, distant people sounds and music
MP4	Evening	56	Insect and bird noise

The ambient A-weighted sound levels varied from a low of 41 dBA at MP3 to a high of 56 dBA at MP4. The variation in sound level appeared to be related to the amount of insect and bird noise. During the morning readings, insect noise was not present. Insects were very loud during the afternoon and evening readings. Overall, the measured ambient noise levels are not uncommon for a rural area.

6. Operational Noise Levels

Siemens-Westinghouse provided noise data for individual components of a 501D5A combustion turbine (Table 6-1). Total sound power at a distance of 3 feet is estimated to be 122 dBA.

Table 6-1:
Siemens-Westinghouse Sound Power Levels
at Octave Band Frequencies for One 501D5A Combustion Turbine Components, dBA

SOUND POWER LEVEL SOURCE		Octave Band Frequency (Hz)									
	ft.	31.5	63	125	250	500	1000	2000	4000	8000	dBA
CT Exhaust Expansion Joint	3	122	125	122	117	107	104	109	109	101	116
CT Exhaust Stack Exit - Includes Directivity & Silencer	3	139	124	114	97	88	90	107	107	105	112
CT Exhaust Stack Walls	3	137	128	122	109	101	101	97	97	92	110
Turbine Enclosure Walls	3	113	109	100	85	74	75	76	76	63	88
Turbine Enclosure Vents	3	114	114	107	93	83	78	86	86	85	96
Open Air-cooled Generator	3	113	112	127	114	97	98	99	99	102	113
Inlet Duct Walls	3	118	115	112	97	100	110	103	103	101	112
Inlet Filter With Evaporative Cooler - Includes Silencer	3	135	131	115	95	84	99	100	100	107	111
Mechanical Package (Total wall & vents)	3	99	99	117	99	100	95	88	88	83	104
Rotor Air Cooler (1 x 100% fin fan)	3	113	123	117	108	101	93	87	87	83	105
Lube Oil Cooler (2 x 50% fin-fan)	3	125	113	120	113	106	99	91	91	86	109
Fuel Gas System	3	131	127	124	115	108	111	105	105	108	116
Total Unit		**143**	**135**	**131**	**122**	**113**	**115**	**113**	**113**	**113**	**122**

Using industry-accepted noise modeling software (CadNa program), the expected project noise levels at the sensitive receptors were calculated. The CadNa program takes into account each piece of noise-emitting equipment on the project site and predicts noise levels in circular contours of equal sound pressure. Attenuation was included for sound propagation over vegetation, barriers, and shielding.

Sound pressure levels were predicted at each of the nearest receptors to the proposed site. Each noise-emitting piece of equipment and each sensitive noise receptor were located in the CadNa program at appropriate distances as determined from United States Geological Survey maps and proposed site layout maps.

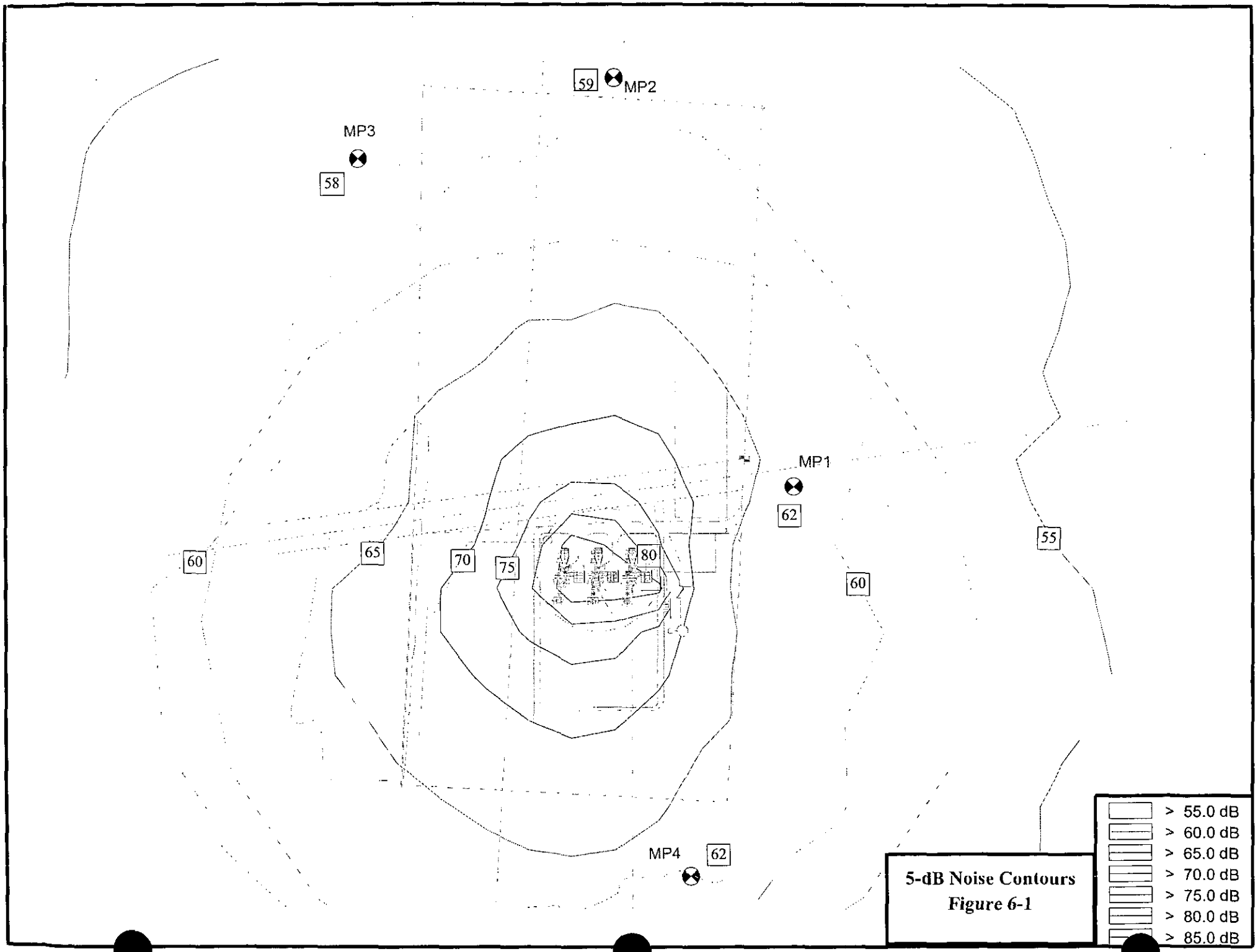
Predicted sound levels at each of the monitoring points were determined by logarithmically adding together the measured background noise levels and the noise levels predicted by the model for each sensitive noise receptor. Total noise levels predicted for each sensitive noise receptor (measuring point) range from 62 dBA at MP1 to 58 dBA at MP3 (Table 6-2). These sound levels are generally related to the proximity of the monitoring point to the project site. The largest increase in sound level would be at MP1, the closest residence to the site, which would increase from 51 dBA to 62 dBA.

Table 6-2:
Background, Equipment and Total
Expected Sound Pressure Levels, dBA

Measurement Points	Sound Pressure Levels, dBA		
	Average Background Noise Level	Predicted New Equipment Noise Level	Total New Noise Level
MP 1	51	62	62
MP 2	50	59	59
MP 3	47	58	58
MP 4	49	62	62

The primary on-site noise sources at the project site are attributable to the combustion turbines' exhaust-flow sound and associated aerodynamic noise. Road traffic directly associated with the project will be limited to operating personnel and supply or maintenance trucks, all of which will enter the site on an infrequent basis. Therefore, the increase in traffic and associated sound is expected to be minimal.

Sound from the Aquila facility will propagate in approximately circular contours of equal sound pressure (Figure 6-1). Two sensitive noise receptors (MP1 and MP4) exist between the 65 and 60 dBA contours and two receptors (MP2 and MP3) exist between the 60 and 55 dBA contours. In accordance with Aquila's self imposed limit, all four receptors will be under the 65 dBA limit.



5-dB Noise Contours
Figure 6-1

7. Impacts to Sensitive Noise Receptors

The sensitive noise receptors closest to the proposed Aquila site are four residences. No schools, hospitals or other community facilities are located within one mile of the site.

8. Equipment and Procedures to Mitigate the Effects of Noise Emissions During Construction and Operation

The following procedures could be used to mitigate sound during construction and operation of the project.

Construction – The construction of the proposed project will be similar to that of any other medium-to large-scale construction project and will generally employ the same types of construction equipment engaged at other construction sites. Pile driving, typically one of the noisiest construction activities, may not be required. Overall site construction work is expected to take about 8 months, during which a number of different construction phases will be completed. Each phase will employ a different mix of equipment and will have different noise emissions.

Operation – Building materials can be selected for their sound attenuating properties. Standard silencing features of stacks and their sound attenuating properties could be considered when specific equipment is selected. The use of acoustic/weather enclosures around major outdoor equipment would help to mitigate the overall sound from the site.

Burns & McDonnell
SINCE 1898

ENVIRONMENTAL STUDIES AND PERMITTING

MEMORANDUM

Date: March 22, 2005

To: Terry Hedrick, Aquila
Block Andrews, Aquila

From: Burns & McDonnell

Regarding: Ambient Noise Monitoring and Noise Projections for Aquila South Harper Peaking Facility

Project No.: 38273

At the Missouri Public Service Commission Public Hearing on March 15, 2005 several comments were stated regarding expected noise at the proposed Aquila South Harper Peaking Facility. This memo comments on the noise issues brought up at the hearing.

On September 7th and 8th of 2004 background noise measurements were taken at nearby residences in the vicinity of the proposed South Harper Peaking Facility by Burns & McDonnell. (See attached Figure 4-1 from the October 2004 Noise Assessment Study.) Four measurement locations near residence were selected for their proximity to the proposed facility. The background noise measurements taken on September 7th and 8th are presented in Table 1. The locations and addresses of applicable locations are also presented in this table.

Table 1:
Existing Background Sound Pressure Levels, dBA

Measurement Points Locations	Time Period	L_{eq} (dBA)	Description of Location
MP1	Morning	44	Near residence east of the site at the intersection of East 243rd Street and South Harper Road
MP2	Morning	44	North of site near residence at 9812 East 241st Street
MP3	Morning	41	Northwest of site near residence at 9601 East 241st Street
MP4	Morning	42	Southeast of site on South Harper Road near residence
MP1	Afternoon	55	Near residence east of the site at the intersection of East 243rd Street and South Harper Road
MP2	Afternoon	51	North of site near residence at 9812 East 241st Street
MP3	Afternoon	49	Northwest of site near residence at 9601 East 241st Street
MP4	Afternoon	50	Southeast of site on South Harper Road near residence
MP1	Evening	54	Near residence east of the site at the intersection of East 243rd Street and South Harper Road
MP2	Evening	54	North of site near residence at 9812 East 241st Street
MP3	Evening	51	Northwest of site near residence at 9601 East 241st Street
MP4	Evening	56	Southeast of site on South Harper Road near residence

During operation noise levels at each measurement point were calculated by a noise modeling program, based on the guaranteed sound power levels of each piece of noise emitting equipment at the site. The projected overall noise levels at each measurement location after the facility is constructed, as discussed in the noise study listed Table 2, below.

Table 2:
Total Expected Sound Pressure Levels, dBA

Measurement Points	Total New Sound Pressure Levels, dBA
MP 1	62
MP 2	59
MP 3	58
MP 4	62

Mr. Mike Tunicliff, who resides approximately 1.25 miles to the northwest of the location of the Aquila South Harper Peaking Facility turbines, requested a noise assessment for his home with regards to the potential noise impacts from the new power plant. To demonstrate an intent to be a good neighbor to the surrounding community, Aquila had Burns & McDonnell perform additional ambient noise monitoring and generate a noise projection study specific for Mr. Tunicliff's residence location. Background noise measurements were taken at this house and found to be around 37 dBA which is typical of a rural neighborhood. The modeled operational noise level at this residence is expected to be 40 dBA when the facility is operating, an increase of 3 dB. The acoustic community accepts that a 3 to 5 dB difference in noise levels is barely perceptible to the human ear. The expected noise level at this home is also significantly below the Federal Highway Administration Noise Criteria Level for residences of 67 dBA.

Aquila, in an effort to be a good neighbor, has proactively incurred the additional costs to attenuate the sound generated by the South Harper Facility. These good intentions don't come without a significant cost to Aquila, nearly $1.2 million of additional costs for thicker stack base materials, taller stacks and additional sound attenuating materials (that have specified vendor guarantees). The exhaust stacks proposed for the South Harper Peaking Facility were specified with extra sound attenuation baffles and additional sound attenuation materials to reduce noise levels from the plant. In addition to the internal noise attenuating features of the exhaust stacks, the stacks will also be fitted with external noise features. Specifically, the exhaust stacks will be enclosed in a noise reducing encasement.

Unfortunately, a direct result of Aquila's efforts to reduce the noise impacts of this facility upon its new neighbors necessitated that the stack heights of the turbines be increased to accommodate the additional necessary noise attenuation materials. The inclusion of additional sound attenuation materials directly resulted in an increase in the original anticipated height of the stack (approximately 50 feet above ground) to 70 feet above plant elevation.

MEMORANDUM

The closest location the noise projection study actually "projected noise for" was at the nearest residence (location MP1) which is approximately 200' due east across Harper Road from the site entrance and had a projected new sound pressure level of only 62 dBA when all three units were operating. After the facility is constructed and operating, Aquila proposes to perform a second noise study to confirm that the actual facility noise emissions are at or below the predicted noise levels. A noise testing protocol similar to the one performed prior to the construction of the facility will be followed. Background noise measurements will be taken while the turbines and the other equipment at the facility are not operating. Operational noise measurements will be taken while all of the turbines are operating at base load at each of the same measurement points identified in the pre-operational noise study (which includes the closest residence). If the noise measurements exceed 62 dBA at any of these locations, Aquila has agreed to pursue appropriate possible solutions to help further mitigate the noise.

ATTACHMENT

Project Site Area

Noise Receptors

N

Source: http://terraserver.microsoft.com, USGS Aerial 1997

Burns & McDonnell
SINCE 1898

Figure 4-1
Aerial Photograph
South Harper Peaking Facility

3.0 PERMITTING

3.1 CONSTRUCTION RELATED PERMITS

3.1.1 Prevention of Significant Deterioration (PSD) Permit to Construct (Air Permit)

Bob Holden, Governor • Stephen M. Mahfood, Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.mo.gov

DEC 29 2004

Mr. Block Andrews
Director of Environmental Services
Aquila, Incorporated
20 West 9th Street
Kansas City, MO 64105

RE: New Source Review Permit - Project Number: 2004-03-143

Dear Mr. Andrews:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions, if any, on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files.

Operation in accordance with these conditions, your new source review permit application and with your Part 70 Operating Permit Application is necessary for continued compliance.

The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact me at (573) 751-4817, or you may write to the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102.

Thank you,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale

Kendall B. Hale
New Source Review Unit Chief

KLM:lkb

Enclosures

c: Kansas City Regional Office
PAMS File: 2004-03-143

Permit Number: 122004-017

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 122004-017 Project Number: 2004-03-143

Owner: Aquila, Incorporated

Owner's Address: 20 West 9th Street, Kansas City, Missouri 64105

Installation Name: South Harper Peaking Facility

Installation Address: 24110 S. Harper Road, Peculiar, Missouri 64078

Location Information: Cass County, S29/32, T45N, R32W

Application for Authority to Construct was made for:

Installation of three natural gas fired simple cycle combustion turbines, a 9.8 million Btu per hour natural gas fired heater, and a 0.47 million Btu per hour emergency diesel fire pump to generate a total nominal electrical power output of 341 megawatts during peak electricity demand periods. This review was conducted in accordance with Section (8), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required.*

☐ Standard Conditions (on reverse) are applicable to this permit.

☑ Standard Conditions (on reverse) and Special Conditions (listed as attachments starting on page 2) are applicable to this permit.

DEC 29 2004

EFFECTIVE DATE

DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

Page No.	2
Permit No.	122004-017
Project No.	2004-03-143

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

South Harper Peaking Facility
Cass County, S29/32, T45N, R32W

1. Operational Limitation

   A. South Harper Peaking Facility (Aquila) shall burn only natural gas from the three natural gas fired simple cycle combustion turbines. If Aquila wishes to use any other type of fuel in the future in any of the three turbines, the Best Available Control Technology (BACT) analysis and ambient air quality analysis will need to be re-evaluated.

   B. Aquila shall limit the total hours of operation of the three Siemens-Westinghouse Model 501D5A turbines (Emissions Points EP-01, EP-02, and EP-03) to less than 5,000 hours in any consecutive 12-month period.

   C. Aquila shall limit the total hours of operation of each of the three Siemens-Westinghouse Model 501D5A turbines (EP-01, EP-02, and EP-03) to less than 2,000 hours in any consecutive 12-month period, except in the case of a Force Majeure Event. In the case of a Force Majeure Event that renders one or two gas turbines inoperable, the total unused permitted hours of operation may be transferred to the remaining operable unit(s). In order for an event to be considered a Force Majeure Event, Aquila must receive approval from the Air Pollution Control Program's Enforcement Section.

   D. Except during periods of startup and shutdown, Aquila shall limit the total hours of operation of the gas heater (EP-04) to less than 6,000 hours in any consecutive 12-month period.

   E. Except during periods of startup and shutdown, Aquila shall run the three Siemens-Westinghouse Model 501D5A turbines (EP-01, EP-02, and EP-03) at a load level no less then 75 percent.

   F. Aquila shall only operational test the emergency fire pump between the hours of 1:00 p.m. and 5:00 p.m. and shall limit the total hours of operation to less than 250 hours in any consecutive 12-month period.

Page No.	3
Permit No.	122004-017
Project No.	2004-03-143

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

2. Emission Limitation

A. Except during periods of startup and shutdown, Aquila shall limit Nitrogen Oxide (NO_X) emissions from each of the Siemens-Westinghouse Model 501D5A turbines (EP-01, EP-02, and EP-03) to 15 parts per million by volume (ppmvd) corrected to 15 percent (%) oxygen on a dry basis for a three-hour rolling average.

B. Except during periods of startup and shutdown, Aquila shall limit Carbon Monoxide (CO) emissions from each of the Siemens-Westinghouse Model 501D5A turbines (EP-01, EP-02, and EP-03) to 25 ppmvd corrected to 15 percent (%) oxygen on a dry basis for a one hour rolling average.

C. Except during periods of startup and shutdown, Aquila shall limit emissions of Particulate Matter less than ten microns in aerodynamic diameter (PM_{10}) to less than 15.25 pounds per hour when utilizing wastewater injection for Turbine Number One (Siemens-Westinghouse Model 501D5A, EP-01) and 10.00 pounds per hour each from Turbine Numbers Two and Three (Siemens-Westinghouse Model 501D5A, EP-02 and EP-03) and Turbine One when not using wastewater injection.

3. Compliance Testing

Stack tests shall be performed on one of the three identical gas turbines permitted herein at Aquila sufficient to demonstrate compliance with the Special Conditions contained in this permit. Specifically, the stack testing shall:

A. Demonstrate compliance with the emission limitations specified in Special Conditions 2.A through 2.C.

B. Develop a formaldehyde emission factor in order to verify the validity of the emission factor used for the modeling analysis. In the event that the stack testing results in an emission factor that exceeds that used in this review, a revised modeling analysis will need to be submitted by Aquila. The revised modeling must be submitted to the Director of the Air Pollution Control Program within 90 days of completion of the required testing.

C. Demonstrate compliance with Subpart GG, *Standards of Performance for Stationary Gas Turbines,* of the New Source Performance Standards (NSPS).

D. Be conducted across the full range of loads (i.e. 75%, 85%, and 100%) that the turbines are expected to operate.

Page No.	4
Permit No.	1220040017
Project No.	2004-03-143

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

E. The stack test shall be performed within 60 days of achieving the maximum production rate of the turbines but no later than 180 days after initial startup for commercial operation of the turbines and shall be conducted in accordance with the stack procedure outlined in Special Conditions 3.A through 3.D. The test shall be conducted every five (5) years from the date of the initial test.

F. The date on which performance tests are conducted must be pre-arranged with the Air Pollution Control Program a minimum of 30 days prior to the proposed test so that a pretest meeting may be arranged if necessary, and to assure that the test date is acceptable for an observer to be present. A completed Proposed Test Plan form (copy enclosed) may serve the purpose of notification and must be approved by the Air Pollution Control Program prior to conducting the required emission testing.

G. Two copies of a written report of the performance test results shall be submitted to the Director of the Air Pollution Control Program within 30 days of completion of any required testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required EPA method for at least one sample run.

H. The test report is to fully account for all operational and emission parameters addressed by these permit conditions as well as in Subpart GG of the NSPS.

I. Pursuant to 40 CFR §60.8(b)(3) and subject to the following conditions, Aquila may substitute the 40 CFR Part 75 NO_X and diluent continuous emission monitoring system (CEMS) certification procedures for the Reference Method 20 testing for the purpose of demonstrating initial compliance with Subpart GG of the NSPS. If the Part 75 NO_X and diluent CEMS certification procedures are chosen to demonstrate initial compliance, Aquila shall adhere to the following requirements:

1) Aquila shall successfully complete the Part 75 NO_X and diluent CEMS certification tests so that the data are, at a minimum, conditionally certified prior to the testing deadlines outlined in 40 CFR §60.8(a) or Part 75, whichever date is earlier.

2) Aquila shall perform a stratification test for NO_X and diluent pursuant to the procedures specified in 40 CFR Part 75, Appendix A, Section 6.5.6.1(a) through (e) or Section 6.5.6.2 (a) through (e).

Page No.	5
Permit No.	122004-017
Project No.	2004-03-143

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

Once the stratification sampling is completed, Aquila shall analyze the data using the procedures in Section 6.5.6.3(a) and (c) to determine if subsequent RATA testing will occur along a short or long reference method measurement line. The short or long reference method measurement line, as determined above, will serve in lieu of the sampling points usually required by Reference Method 20. In no case shall RATA be based on fewer than three sample points as specified in 40 CFR Part 60, Appendix B, Performance Specification 2, Section 3.2.

3) Since the PSD permit limits Aquila to only natural gas, the SO_2 measurement requirements under 40 CFR Part 60, Appendix A, Reference Method 20, Section 6.3 are waived pursuant to 40 CFR §60.8(b)(4).

4. Continuous Emission Monitoring System (CEMS)

A. Aquila shall install, calibrate, maintain, and operate CEMS, and record the output of the systems, for measuring NO_X emissions discharged into the atmosphere. The CEMS shall be installed and operated according to the guidelines in 40 CFR Part 75 for the NO_X and diluent CEMS requirements. These systems shall be placed in an appropriate location on each combustion turbine's flue gas exhaust such that accurate readings are possible.

B. Aquila shall install, calibrate, maintain, and operate a CEMS, and record the output of the systems, for measuring the oxygen (O_2) content of the flue gases at each location where NO_X emissions are monitored. The O_2 content of the flue gases may be determined by use of either an O_2 CEMS or a CO_2 CEMS. If Aquila elects to use a CO_2 CEMS, the conversion process in EPA Method 20 must be used to correct the NO_X concentrations to 15 percent O_2.

5. Record Keeping

A. Aquila shall keep monthly, and the sum of the most recent 12-months, records that are adequate to determine compliance with Special Condition Number 1.B (total installation hours of operation). Attachment A, *Operational Schedule of the Three Siemens-Westinghouse Model 501D5A Turbines,* or an equivalent form of the company's own design, is suitable for this purpose. The most recent 60 months of records shall be maintained on-site and shall be made immediately available to Missouri Department of Natural Resources' personnel upon request.

Page No.	6
Permit No.	122004-017
Project No.	2004-03-143

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

B. Aquila shall keep monthly, and the sum of the most recent 12-months, records that are adequate to determine compliance with Special Condition Number 1.C (individual turbine hours of operation). Attachment B, *Individual Turbine Operational Schedule*, or an equivalent form of the company's own design, is suitable for this purpose. The most recent 60 months of records shall be maintained on-site and shall be made immediately available to Missouri Department of Natural Resources' personnel upon request.

C. Aquila shall keep monthly, and the sum of the most recent 12-months, records that are adequate to determine compliance with Special Condition Number 1.D (gas heater hours of operation). Attachment C, *Gas Heater Operational Schedule*, or an equivalent form of the company's own design, is suitable for this purpose. The most recent 60 months of records shall be maintained on-site and shall be made immediately available to Missouri Department of Natural Resources' personnel upon request.

D. Aquila shall keep monthly, and the sum of the most recent 12-months, records that are adequate to determine compliance with Special Condition Number 1.F (fire pump hours of operation). Attachment D, *Fire Pump Operational Schedule*, or an equivalent form of the company's own design, is suitable for this purpose. The most recent 60 months of records shall be maintained on-site and shall be made immediately available to Missouri Department of Natural Resources' personnel upon request.

6. Reporting

A. Aquila shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, Missouri 65102, no later than ten (10) days after the end of each month if the 12-month cumulative total (Special Condition 5.A) records show that the source exceeded the limitation of Special Condition 1.B (5,000 hours of operation).

B. Aquila shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, Missouri 65102, no later than ten (10) days after the end of each month if the 12-month cumulative total (Special Condition 5.B) records show that the source exceeded the limitation of Special Condition 1.C (2,000 hours of operation per turbine).

C. Aquila shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, Missouri 65102, no later than ten

Page No.	7
Permit No.	122004-017
Project No.	2004-03-143

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

(10) days after the end of each month if the 12-month cumulative total (Special Condition 5.C) records show that the source exceeded the limitation of Special Condition 1.D (6,000 hours of operation).

D. Aquila shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, Missouri 65102, no later than ten (10) days after the end of each month if the 12-month cumulative total (Special Condition 5.D) records show that the source exceeded the limitation of Special Condition 1.F (250 hours of operation).

E. Pursuant to 40 CFR §60.13(i), Aquila may make use of 40 CFR Part 75, Appendix D as an alternative to the fuel monitoring and sulfur fuel sampling and analysis requirements of Subpart GG of the NSPS. If Aquila elects to use this alternative, Aquila is subject to the following requirements:

1) Aquila shall submit an excess emissions report to the Air Pollution Control Program's Enforcement Section consistent with the format and schedule described in 40 CFR §60.7(d); and

2) For the purpose of excess emission reporting, Aquila shall report each day during which the sulfur content of the fuel exceeds the 0.8 percent by weight limitation.

F. Aquila shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, Missouri 65102, no later than ten (10) days after the end of the month, in which performance testing has been performed and indicates non-compliance with Special Condition 2.A, 2,B, or 2.C.

G. In the case of a Force Majeure Event, Aquila shall notify the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, Missouri 65102, no later than ten (10) days after an event has occurred that Aquila feels meets the definition of a Force Majeure Event.

Note 1: The term "startup and shutdown" used herein is hereby defined as those periods of time that a gas turbine is operated at a load level less than 75%.

Note 2: The term "Force Majeure Event" used herein is hereby defined as any event, occurrence, or circumstance beyond the reasonable control of, and without the fault or negligence of, Aquila. "Force Majeure Event " shall include, but are not limited to, earthquakes, fires, floods, lightning strikes,

Page No.	8
Permit No.	122004-017
Project No.	2004-03-143

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

acts of the public enemy, war, or regulations or restrictions imposed by governmental, military, or lawfully established civilian authorities. A claim of Force Majeure Event is subject to the approval of the Air Pollution Control Program Enforcement Section.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (8) REVIEW
Project Number: 2004-03-143
Installation ID Number: 037-0063
Permit Number: 1220047017

South Harper Peaking Facility
24110 S. Harper Road
Peculiar, Missouri 64708

Complete: March 29, 2004
Reviewed: April 7, 2004

Parent Company:
Aquila, Incorporated
20 West 9th Street
Kansas City, Missouri 64105

Cass County, S29/32, T45N, R32W

REVIEW SUMMARY

- South Harper Peaking Facility (Aquila) has applied for the authority to install three natural gas fired simple cycle combustion turbines to generate a total nominal electrical power output of 341 megawatts (MW) during peak electricity demand periods. The three gas turbines to be utilized are identical Siemens Westinghouse Model 501D5A units. The individual turbine units have a maximum hourly design rate (MHDR) heat input of 1,455 million British Thermal Units (MMBtu) per hour. The project will also consist of a 9.8 MMBtu per hour natural gas fired heater, used to pre-heat the natural gas fuel supplied to the turbines and a 0.47 MMBtu per hour emergency diesel fire pump.

- Hazardous Air Pollutant (HAP) emissions are expected from the heater and three turbines due to the combustion of natural gas and the fire pump due to the combustion of diesel fuel. The primary HAPs of concern from the proposed equipment are acrolein, formaldehyde, and polycyclic aromatic hydrocarbons (PAH). The potential emissions of formaldehyde (CAS Number 50-00-0) are above its respective threshold level, but less than major source levels.

- 40 CFR Part 60 Subpart GG, *Standards of Performance for Stationary Gas Turbines* is applicable to the three gas turbines permitted herein.

- None of the National Emission Standards for Hazardous Air Pollutants (NESHAP) in 40 CFR Part 61 are applicable to this project.

- Maximum Achievable Control Technology (MACT), Subpart YYYY, *Combustion Turbines* does not apply because potential emissions of individual and combined HAPs are indirectly limited to a de minimis level by the hours of operation conditions of this permit.

- This review was conducted in accordance with Section (8) of Missouri State Rule 10

CSR 10-6.060, *Construction Permit Required.* Potential emissions of PM_{10}, NO_X and CO are above major thresholds. Potential emissions of VOC are greater than de minimis levels. Potential emissions of individual and combined HAPs are indirectly limited to a de minimis level by the hours of operation conditions of this permit.

- Since potential emissions of total and individual HAPs are at de minimis levels, this installation is not considered a major source of HAPs as defined in 40 CFR Part 63, and 10 CSR 10-6.060(9).

- The Best Available Control Technology (BACT) requirements apply to the proposed equipment. The BACT analysis was based upon each turbine operating in simple cycle mode, burning exclusively natural gas, and operating only 2,000 hours per year. The gas heater will operate only 6,000 hours per year. NO_X emissions from the gas turbines will be controlled through the use of dry low-NO_X burners. Low NO_x burners will also be employed on the gas heater. Ignition Timing Retard will be used on the emergency fire pump for NO_x emission control. Good combustion practices will be utilized to control CO emissions. The exclusive use of low ash/low sulfur containing fuel, together with good combustion practices, will be utilized in controlling PM_{10} and SO_X emissions from all equipment. A re-evaluation of the BACT analysis and/or ambient air quality analysis will be required if South Harper Peaking Facility wishes to: retrofit the turbines with a heat recovery steam generator within a short period of time (e.g. 4-5 years) that would otherwise be accommodated within a phased Prevention of Significant Deterioration (PSD) permit, burn other forms of fuel in any of the equipment, or wishes to increase the hours of operation limitation for any piece of equipment.

- This installation is on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2] Number 27. A stationary source category which, as of August 7, 1980, is being regulated under Section 111 or 112 of the Act. This installation is subject to Subpart GG of the NSPS, which applies to gas turbines installed after October 3, 1977. Therefore, the major source threshold for all criteria pollutants is 100 tons per year.

- This installation is located in Cass County, which is not currently designated nonattainment for any criteria pollutant.

- Air quality modeling for this project was performed to determine the ambient impact of those pollutants that will be emitted in significant amounts (NO_X, CO, and PM_{10}). Air quality modeling was also performed to determine the ambient impact of formaldehyde. Based upon the model reviewed by the Air Pollution Control Program staff, the study submitted by Aquila is complete and demonstrates there will not be an exceedance of the National Ambient Air Quality Standards (NAAQS), Risk Assessment Levels (RALs), or available increment.

- Ambient air monitoring was not required for this project since the modeling analysis indicated that the ambient impacts of the modeled pollutants were below significance thresholds. Continuous Emission Monitoring Systems (CEMS) are required on each combustion turbine to demonstrate compliance with NO_X emissions limits.

- Emission testing for NO_X, CO, PM_{10}, and formaldehyde will be required as specified in the special conditions of this permit.

- A Part 70 Operating Permit application is required for this installation within 1 year of equipment startup.

- Approval of this permit is recommended with special conditions.

INSTALLATION/PROJECT DESCRIPTION

South Harper Peaking Facility (Aquila) has applied for the authority to construct three natural gas fired simple cycle combustion turbines to generate a total nominal electrical power output of 341 MW during peak electricity demand periods in Cass County near Peculiar, Missouri. The plant was to be located originally near Harrisonville, Missouri and public notice for the initial location took place earlier this year. On September 13, 2004, a revised PSD permit application was received changing the location of the plant to Peculiar, Missouri.

The three gas turbines to be utilized for this project are identical Siemens-Westinghouse Model 501D5A units that will be fired exclusively with natural gas. The individual turbine units have a heat input of 1,455 MMBtu per hour. This heat input is taken at a worst case ambient temperature of negative 1.8 degrees Fahrenheit (°F), an ambient relative humidity of 60%, a barometric pressure of 14.458 pounds per square inch absolute, and is based on a higher heating value of natural gas. Each 4-stage Siemens-Westinghouse Model 501D5A gas turbine utilizes 14 can-type dry low-NO_X combustors in a circular array. It incorporates a 19-stage axial flow compressor, and utilizes electric starting motors. Each turbine will power an air-cooled, 60 hertz (i.e. 3600 revolutions per minute) generator. The project will also consist of a 9.8 MMBtu per hour natural gas fired heater used to heat the natural gas fuel supplied to the turbines and a 0.47 MMBtu per hour emergency diesel fire pump.

Simple cycle turbines have high volume, high temperature exhaust streams. The maximum heat input and subsequent generating capacity of each turbine depends on ambient conditions. At higher temperatures, the heat consumption and output generally decreases. Potential emissions from the turbines are greatest during periods of low ambient temperature since more fuel can be burned during these times. However, the turbine is operating at its maximum efficiency during lower temperatures. The Siemens-Westinghouse Model 501D5A turbines are equipped with dry low-NO_X burners, which will achieve a maximum NO_X emission rate of 15 parts per million by volume on a dry basis (ppmvd) when corrected to 15% oxygen in the stack gas.

In order to distinguish between a peaking station and a baseload station, the Air Pollution Control Program has previously limited the hours of operation of power plants that are strictly designed as peaking stations. The limitation on hours of operation ensures an installation, that is permitted as a peaking station, does not operate continuously as a baseload station. The annual hours of operations that a power plant will operate impacts the conclusions arrived at in a project's Best Available Control Technology (BACT) analysis.

Recent permits issued by the Air Pollution Control Program have limited each turbine to 2,000 hours per year with a limitation of 5,000 hours per year for all the turbines combined. The same limitations apply to the Aquila installation. For record keeping purposes, operational time is considered to be the total number of hours that Aquila has any of the three or combination of the three turbines connected to the utility grid by closure of the generator breaker.

EMISSIONS/CONTROLS EVALUATION

All of the criteria pollutants will be emitted from the operation of these units, with PM_{10}, NO_X, and CO being emitted in amounts greater than significance levels (i.e. greater than de minimis levels). HAP emissions are also expected due to the operation of the turbines, with the main HAP of concern being formaldehyde. Potential emissions of both formaldehyde and VOCs are indirectly limited to their respective de minimis levels by the hours of operation conditions in this permit. The emission factor used to determine formaldehyde emissions will be verified through stack testing. Dry low-NO_X burners will be used to control NO_X emissions from the turbines. The Special Conditions of this permit limits the NO_X emissions to 15 ppmvd on a three-hour rolling average. Good combustion practices will be used to control CO emissions from the turbines. The CO emissions of the turbines are limited to 25 ppmvd on a one-hour rolling average by the Special Conditions of this permit.

The emission factors used to estimate emissions from the Siemens-Westinghouse Model 501D5A turbines for the criteria pollutants were provided by the equipment manufacturer.

Potential emissions of the application represent the potential of the proposed equipment, assuming continuous operation (8760 hours per year). Conditioned potential emissions are based on an annual limit of 2,000 hours for each the three turbines and 6,000 hours for the gas heater. The potential emissions in Table 1 represent the emission rate at 100% loading and ambient conditions of 0.0°F. Emissions from start-up and shutdown are not included in the emission estimates in the table.

Table 1: Emissions Summary (tons per year)

Pollutant	Regulatory *De Minimis* Levels	Existing Potential Emissions	Existing Actual Emission	Potential Emissions for the Application	Conditioned Potential Based on Requested Limitation	New Installation Conditioned Potential
PM_{10}	15.0	N/A	N/A	154.72	35.47	N/A
SO_x	40.0	N/A	N/A	12.00	2.86	N/A
NO_x	40.0	N/A	N/A	1,075.16	247.42	N/A
VOC	40.0	N/A	N/A	75.13	17.26	N/A
CO	100.0	N/A	N/A	1,090.22	250.53	N/A
Acrolein	0.04*/10.0	N/A	N/A	0.12	0.03	N/A
Formaldehyde	2.0*/10.0	N/A	N/A	13.58	3.10	N/A
PAH	0.01*/10.0	N/A	N/A	0.04	0.01	N/A
Total HAPs	10.0/25.0	N/A	N/A	19.72	4.54	N/A

N/A = Not Applicable
* Threshold level for the HAP of concern.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (8) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of NO_X and CO are above major thresholds. Potential emissions of PM_{10} are above significant levels (i.e. de minimis levels). Potential emissions of all other pollutants are at de minimis levels.

APPLICABLE REQUIREMENTS

South Harper Peaking Facility shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit application.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110

  The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required April 1 for the previous year's emissions.

- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-2.070

SPECIFIC REQUIREMENTS

- *Maximum Allowable Emissions of Particulate Matter From Fuel Burning Equipment Used for Indirect Heating*, 10 CSR 10-2.040
- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Stationary Gas Turbines*, 40 CFR Part 60, Subpart GG.
- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260
- *Acid Rain Source Permits Required*, 10 CSR 10-6.270
- *Emission Limitations and Emissions Trading of Oxides of Nitrogen*, 10 CSR 10-6.350
- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400

BACT ANALYSIS

Introduction

Any source subject to Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, Section (8) must conduct a Best Available Control Technology (BACT) analysis on any pollutant emitted in greater than de minimis levels. The BACT requirement is detailed in Section 165(a)(4) of the Clean Air Act, at 40 CFR 52.21 and 10 CSR 10-0.60(8)(B).

A BACT analysis is done on a case by case basis and is performed using a "top-down" method. The following steps detail the top-down approach:

1. Identify all potential control technologies – must be a comprehensive list, it may include technology employed outside the United States and must include the Lowest Achievable Emission Rate (LAER) determinations.
2. Eliminate technically infeasible options – must be well documented and must preclude the successful use of the control option.
3. Rank remaining control technologies – based on control effectiveness, expected emission rate, expected emission reduction, energy impacts, environmental impacts, and economic impacts.

4. Evaluate the most effective controls – based on case by case consideration of energy, environmental, and economic impacts.
5. Select BACT.

The three turbines, gas heater and emergency fire pump being permitted by Aquila are subject to BACT analysis for PM_{10}, NO_X, and CO emissions. Aquila prepared a BACT analysis based on the U.S. EPA RACT/BACT/LAER Clearinghouse (RBLC) database, vendor information, and previous permits for combustion turbines gas heaters and fire pumps issued in the State of Missouri and elsewhere. The BACT determination for the turbines must be at least as stringent as the NSPS for Combustion Turbines set forth in 40 CFR 60. The applicant has proposed emissions well below the NSPS limits. The BACT analysis is summarized, by pollutant, below.

NO_X Control Technologies

The conditioned potential emissions of NO_X resulting from the project permitted herein are significant (i.e. greater than 40.0 tons per year). Therefore, a BACT analysis is required for this pollutant. Table 2 lists the control technologies Aquila evaluated for this review (in order of control achieved) and the emission rates each control technology can attain.

Table 2: NO_X Control Technologies Considered

Control Technology	Equipment	Emission Rate/Control Efficiency Achieved
SCONOX™	Turbines	2 ppmvd
XONON ™	Turbines	3 ppmvd
Selective Catalytic Reduction (SCR)	Turbines	3-9 ppmvd
Selective Non-catalytic Reduction (SNCR)	Turbines	4-10 ppmvd
Dry Low-NO_X Burner	Turbines	9-25 ppmvd
Water/Steam Injection	Turbines	22-42 ppmvd
Low-NOx Burner	Gas Heater	N/D*
Selective Catalytic Reduction (SCR)	Gas Heater	90% C.E.
Ignition Timing Retard (ITR)	Emergency Diesel Fire Pump	N/D*
Selective Catalytic Reduction (SCR)	Emergency Diesel Fire Pump	90% C.E.

*N/D = Not Determined

SCONOX™

The SCONOX™ system is an add-on control device that uses an oxidation/absorption/regeneration cycle across a catalyst bed to achieve back-end reductions of NO_X, CO, and VOC. The system does not require ammonia as a reagent, and involves parallel catalyst beds that are alternately taken off line through means of mechanical dampers for regeneration.

According to Goal Line Technologies, LLC, the SCONOX™ catalyst works by *simultaneously* oxidizing CO to CO_2, NO to NO_2, and then absorbing NO_2. The NO_2 is absorbed into a potassium carbonate catalyst coating as potassium nitrite (KNO_2) and potassium nitrate (KNO_3). When a catalyst module begins to become loaded with KNO_2 and KNO_2, it is taken off line and isolated from the flue gas stream with mechanical dampers for regeneration.

Once the module has been isolated from the turbine exhaust [contains approximately five percent (5%) oxygen], four percent (4%) hydrogen in an inert carrier gas of nitrogen or steam is introduced. An absence of oxygen is necessary to retain the reducing properties necessary for regeneration. The lower flammability limit for hydrogen is 4%, so it is important that the air seals around the dampers do not leak. Hydrogen reacts with potassium nitrites and nitrates during regeneration to form water (H_2O) and nitrogen (N_2), which is emitted from the stack.

The SCONOX™ system can operate effectively at temperatures ranging from 300°F to 700°F. The gas turbines permitted herein will have an exhaust gas temperature of 950°F to 984°F. The exhaust gas from these turbines would have to be lowered to accommodate this air pollution control system. The SCONOX™ system manufacturer indicates that this technology can be applied to simple cycle turbines. Therefore, this control technology is considered technically feasible for this project.

SCONOX™ is a new technology and has been demonstrated on a 23 MW combined cycle turbine in the State of California. However, it has yet to be demonstrated for long term commercial operation on simple cycle turbines operated as peak power generation units. It is an inherent necessity for peak power generation units to be capable of rapid start-up and shutdown. The unknowns associated with any pollution control system which is the first of its kind, and which has no long term company or operation history, represents a level of risk that would alter the ability to reasonably finance the project. Therefore, SCONOX™ was eliminated as BACT for NO_X for this project.

XONON™

The XONON™ technology replaces traditional flame combustion with flameless catalytic combustion. The XONON™ system utilizes a chemical process versus a flame to combust fuel, thus limiting temperature and NO_X formation. Due to the subsequent low temperature of the process, thermal NO_X is virtually eliminated. This technology designed by Catalytica, Inc. has undergone testing on a 1.5 MW Kawasaki turbine in the State of California, which operates continually in a baseload capacity. NO_X emissions of three ppm or less have been demonstrated. Tests are currently underway to apply this technology to other types and sizes of turbines, but that data is currently unavailable. At this time it is unclear whether this technology, in its current state, could be applied to turbines used to generate peak power, which experiences repeated start-up, shutdowns, and changing load conditions. Therefore, for the purposes of this BACT analysis, the XONON™ system was not considered to be technically feasible.

Selective Catalytic Reduction (SCR)

SCR is a post-combustion control technology in which ammonia is added to the flue gas in the presence of a catalyst. The ammonia and NO_X react to form nitrogen and water. Since the exhaust stream for the turbines permitted herein is between 950°F and 984°F, a high temperature catalyst must be considered. High temperature zeolite catalysts do exist that allow the gases entering the SCR to reach temperatures of 1,050°F and greater. High excess air concentrations and high fuel combustion temperatures create NO_X. Lowering flame temperatures and controlling oxygen-fuel mix ratios at critical points in the combustion process can reduce NO_X formation. The catalyst accelerates the chemical reaction in which the ammonia and NO_X react to form nitrogen and water.

With SCR technology, the percent reduction of NO_X emissions can be increased by adding additional catalyst and ammonia. SCR is considered technically feasible for this application.

The feasibility of SCR was evaluated based upon economic, energy, and environmental impacts. The ammonia that does not react with NO_X passes through the system and is released into the atmosphere. In addition, SCR would cause a loss of energy due to an increase in back pressure on the combustion turbines as a result of the pressure drop across the catalyst bed. Also, the start-up and shutdown requirements of the additional SCR equipment would severely impair the "quick start" capability of the peaking turbine generators thereby eliminating the "spinning reserve" capacity of the peaking units. The use of SCR was estimated to cost $13,776 per ton of NO_X removed. This cost estimate was based upon each turbine operating 2,000 hours per year. Thus, SCR was eliminated as BACT due its cost for the limited number of operational hours being permitted (2,000 hours per turbine per year).

Selective Non-catalytic Reduction (SNCR)

SNCR is a post-combustion NO_X control technology in which a reagent (ammonia or urea) is injected into the exhaust gases in a temperature range between 1,700°F and 2,000°F. The reagent reacts chemically with NO_X forming nitrogen and water. Outside the upper end of this temperature range, the reagent is converted to NO_X. Outside the lower end of this temperature range, the reagent will not react and the reagent is discharged into the atmosphere. The Siemens-Westinghouse Model 501D5A turbines have exhaust temperatures up to approximately 984°F. Thus, in order to reach the temperature range in which SNCR is effective, the exhaust temperature of the turbines would need to be raised. To raise the exhaust temperature, additional fuel would need to be combusted and thereby increasing the NO_X and other criteria pollutant emissions. SNCR has not been applied to any combustion turbines according the RBLC database. Based upon this information, SNCR was eliminated as BACT for this project.

Dry Low-NO_X Combustors

Typically high fuel combustion temperature and high excess air concentrations create NO_X. Lowering the flame temperature and controlling the oxygen-fuel mix ratios at critical points in the combustion process can reduce NO_X formation. Because of their low cost-effectiveness per ton of NO_X reduced, dry low-NO_X technology has been rapidly incorporated into new equipment designs. Dry low-NO_X burners can achieve NO_X emissions at or below 15 ppm. For this project, dry low-NO_X technology is integrated into the design of the Siemens-Westinghouse Model 501D5A turbines and represents the baseline emission of 15 ppm for this turbine.

Water or Steam Injection

This is a combustion control technology that utilizes water or steam for flame quenching to reduce peak flame temperatures and thereby reduce NO_X formation. The injection of water or steam into a gas turbine can increase the power output by increasing the mass throughput, but at the same time reduces the efficiency of the turbine. Typically, water injection can achieve NO_X emission levels of 22 ppm while firing natural gas. Since dry low-NO_X burners are all ready being installed on the turbines and dry low-NO_X burners cannot be used with water or steam injection for additional NO_X control, water injection has been eliminated as BACT for this project.

Selection of NO_X Control Technology for Turbines
For this project, consisting of three stationary gas turbines operating in simple cycle mode for generation of electrical power during peak electricity demand periods and considering the 2,000 hours per year operational limitation, dry low NOx combustors with a NO_X emission limit of 15 ppmvd when corrected to 15% oxygen on a dry basis is considered BACT. This limitation is based on a three hour rolling average, and is not applicable during periods of startup and shut down.

Selection of NO_x Control Technology for Fuel Gas Heater
The RBLC web page does not list information regarding control equipment for gas heaters of this size. The only add-on NO_x control technique available for a unit the size that Aquila intends to install is SCR. The SCR process for removal of NO_x is discussed in the SCR section above. The vendor's removal efficiency for NO_x is 90%. The overall initial capital cost of installing an SCR system on the gas heater is approximately $119,000. On an annual basis, the SCR system would cost $102,900, which results in a cost per ton of NO_x removed of $58,000 while removing only 1.8 tons of NO_x per year. Based on environmental and economic impacts, low- NO_x burners are considered to be BACT.

Selection of NO_x Control Technology for Emergency Diesel Fire Pump
The use of add-on controls has not been documented in the RBLC for emergency fire pumps similar to this unit. However, SCR system vendors have indicated that these controls are available for the fire pump and for a unit of the size Aquila intends to install, 90% removal efficiency can be expected. The overall initial capital cost of installing an SCR system on a fire pump is approximately $131,300. On an annual basis, the SCR system would cost $43,960, which results in a cost per ton of NO_x removed of $189,690, while removing only 0.2 tons of NO_x per year. With such a low amount of NO_x removed at such a high cost per ton, SCR was not selected as BACT. Instead NO_x emissions on these diesel-fired units will be controlled by the use of ignition timing retard (ITR).

CO Control Technology

The conditioned potential emissions of CO resulting from the project permitted herein are significant (i.e., greater than 100.0 tons per year). Therefore, a BACT analysis is required for this pollutant. Table 3 lists the control technology Aquila evaluated for the BACT analysis for CO (in order of control achieved) and the emission rates each control technology can attain.

Table 3: CO Control Technology

Control Technology	Equipment	Controlled CO Emission Level
SCONOX™	Turbines	2 ppm
Oxidation Catalyst	Turbines	2 ppm
Combustion Control	Turbines	25 ppm
Good Combustion Practices	Gas Heater, Emergency Fire Pump	N/D*
Oxidation Catalyst	Gas Heater, Emergency Fire Pump	N/D*

*N/D = Not Determined

SCONOX™

SCONOX™

The SCONOX™ system was described in the BACT analysis for NO_X. In addition to controlling NO_X, the SCONOX™ system also controls VOC and CO. In analyzing the feasibility of the SCONOX™ system for this project, the review took into account the fact SCONOX™ controls all three pollutants. The reasons as to why SCONOX™ was eliminated as BACT for NO_X also result in the elimination of SCONOX™ as BACT for CO.

Oxidation Catalysts

Oxidation catalysts are a post-combustion technology used to oxidize CO to Carbon Dioxide (CO_2) without the introduction of additional chemicals. The activation energy for this reaction is lowered through the use of a catalyst and the oxidation then proceeds by utilizing excess air present in the turbine exhaust. An oxidation catalyst is usually platinum based, and operates in an optimal temperature range between 700°F and 1,100°F. Catalyst sintering can occur at higher temperatures resulting in permanent damage to the catalyst. Also, the addition of a catalyst bed onto the turbine exhaust will create a pressure drop, resulting in back pressure on the turbine. This reduces the turbine's efficiency and translates into energy costs. Conversion efficiencies for CO up to 95% are possible, and catalysts are available that will effectively handle the temperature range at which these turbines will operate.

Oxidation catalyst has not typically been required as BACT for natural gas combustion turbines operated in simple cycle mode and used exclusively for peaking service. The Missouri Department of Natural Resources acknowledges that oxidation catalyst has not been widely required as BACT in previous determinations. However, the use of oxidation catalyst is increasing and sources are voluntarily installing oxidation catalyst. The use of an Oxidation Catalyst was estimated to cost $8,618 per ton of CO removed. After evaluating the environmental, economical, and energy impacts for this permit application and considering the limited number of hours of operation to be permitted (2,000 hours per year per turbine), oxidation catalyst was eliminated as BACT for CO control.

Combustion Control

Good combustion practices include turbine design and operational elements to control the amount and distribution of excess air in the turbine combustion section and turbine exhaust gas. Good combustion practices applied to the Siemens Westinghouse Model 501D5A turbines can achieve CO emissions of 25 ppmv when corrected to 15% oxygen on a dry basis, during steady state operation.

Selection of CO Control Technology for Turbines

The control technologies were evaluated considering control effectiveness, expected emission rate, expected emission reduction, energy impacts, environmental impacts, economic impacts, and the limited number of hours of operation (2,000 hours per turbine). For this project, consisting of three stationary gas turbines operating in simple cycle mode for generation of electrical power during peak electricity demand periods and considering the 2,000 hours per year per turbine operational limitation, a CO emission limit of 25 ppmvd when corrected to 15% oxygen on a dry basis using combustion control is considered BACT. This limitation is based on a three-hour rolling average, and is not applicable during periods of start-up and shutdown.

Selection of CO Control Technology for Gas Heater
The RBLC does not list gas heater BACT determinations for control of CO emissions from gas heaters, however, one control vendor has indicated that a CO catalyst system may be used on a gas heater this size. The CO catalyst system is an add-on control that converts CO to CO_2 by use of a catalyst. The system is further described in the Oxidation Catalysts section above. On an annual basis, only 3.2 tons per year of CO would be removed at a cost of close to $12,700 per ton. This cost is considered to be economically unfeasible, therefore, add-on controls for CO emissions from the gas heater are not considered BACT. BACT for CO emissions from the gas heater is good combustion practices.

Selection of CO Control Technology for Emergency Diesel Fire Pump
The RBLC does not list CO add-on controls for emergency engines of this size. CO catalyst systems are available from vendors, however. A discussion of CO catalyst systems can be found in the Oxidation Catalysts section above. Because only 0.019 tons of CO would be removed, the cost per ton is over $756,000. These costs are considered economically infeasible, therefore, add-on controls for the emergency diesel fire pump are not considered for BACT. BACT for the fire pump is good combustion practices.

PM_{10} Control Technology

The conditioned potential emissions of PM_{10} resulting from the project permitted herein are significant (i.e. greater than 15.0 tons per year). Therefore, a BACT analysis is required for this pollutant.

PM_{10} emissions resulting from the combustion of natural gas are due to oxidation of sulfur contained in the fuel. Due to its low ash and sulfur content, natural gas combustion generates inherently low PM_{10} emissions. Available technologies used for controlling PM_{10} are centrifugal (cyclone) collectors, electrostatic precipitators, wet scrubbers, and fabric filters (baghouse).

While all of these post-process technologies would be technically feasible for controlling PM_{10} emissions from combustion turbines, none of the previously described control equipment has been applied to combustion turbines exclusively burning natural gas since exhaust gas PM concentrations are inherently low. Combustion turbines operate with a significant amount of excess air that generates large exhaust gas flow rates. Aquila's combustion turbines will generate low PM emissions in comparison to other fuels due to the low ash and sulfur content of natural gas. Exhaust stream PM_{10} concentrations of such low magnitude are not amenable to control using available technologies since removal efficiencies would be unreasonably low and cost excessive. Along the same vein, units as small as the gas heater and emergency fire pump are not designed. Because post-process stack controls for PM/PM_{10} are not economical for combustion turbines used exclusively in simple cycle peaking service, it was determined that BACT for PM_{10} is the use of good combustion practices for all equipment permitted in this project.

AMBIENT AIR QUALITY IMPACT ANALYSIS

Aquila submitted a refined modeling analysis that estimates the ambient impact of NO_X, CO, PM_{10}, and formaldehyde. This analysis was performed with the Industrial Source Complex Short Term (ISCST3) dispersion model. This is an EPA approved model that is appropriate for the refined modeling required for major source review.

Emissions are generated from three combustion turbines, the natural gas heater, and the emergency diesel fire pump. The emission rate from the turbine stack will depend on the mode of operation. The turbines were modeled for operation at the ambient temperature, which corresponds to the maximum emission rate at 75%, 85%, and 100% loads. The maximum emission rate for each load occurs at an ambient temperature of 0.0°F. The following tables contain the release parameters and the emissions rates for emission points from Aquila that were considered in the modeling.

Table 4: Aquila Modeled Stack Parameters

Unit	Source ID	Operating Cases	Stack Height (ft)	Stack Diameter (ft)	Stack Temperature (K)	Stack Exit Velocity (ft/s)
Turbine Number 1	EP-01	100% 85% 75%	55	24	786 (766) 745 (725) 727 (708)	58.1 (56.6) 51.8 (50.5) 47.7 (46.5)
Turbine Number 2	EP-02	100% 85% 75%	55	24	786 745 727	58.1 51.8 47.7
Turbine Number 3	EP-03	100% 85% 75%	55	24	786 745 727	58.1 51.8 47.7
Gas Heater	EP-04	100%	43	2.5	616	31.7
Fire Pump	EP-05	100%	17	0.5	804	0.33**

*Temperature and exit velocity of Turbine 1 are less when wastewater is injected.
**Rain cap on end of stack.

Table 5: Aquila Modeled Emission Rates

Unit	Operating Cases	CO (lb/hr)	NO_X (Note 1) (lb/hr)	PM (lb/hr)	Formaldehyde (lb/hr)
Turbine Number 1	100% 85% 75%	82.70 71.00 63.00	18.61 15.96 14.16	All Loads 10.00 (15.25)	1.03 0.88 0.79
Turbine Number 2	100% 85% 75%	82.70 71.00 63.00	18.61 15.96 14.16	All Loads 10.00	1.03 0.88 0.79
Turbine Number 3	100% 85% 75%	82.70 71.00 63.00	18.61 15.96 14.16	All Loads 10.00	1.03 0.88 0.79
Gas Heater	100%	0.80	0.31	0.07	7.21×10^{-4}
Fire Pump	100%	0.17	2.06	0.04	3.67×10^{-5}

Note 1: Emission rate based on 2,000 hours of operation per year per turbine, 6,000 hours per year for the gas heater and 250 hours per year for the fire pump.
Note 2: Emission rate in parenthesis indicates use of wastewater injection.

In each case considered in the modeling, the significance levels were not exceeded for NO_X, CO, or PM_{10}. The modeling also demonstrated that the 24-hour and annual Risk Assessment Level (RAL) for formaldehyde would not be exceeded. For the criteria pollutants (NO_X, CO, PM_{10}), the significance level is the trigger point for an increment consumption analysis and an overall ambient impact analysis. The demonstration that the significance levels are not exceeded is the only modeling requirement for this review. The insignificant modeled impacts also eliminate the need for pre-construction monitoring for NO_X, CO, or PM_{10}.

Upon further internal review, the Special Conditions contained in this permit were revised as described below to more accurately represent the data used in the modeling analysis. Load-based limits for the turbines were found to be redundant, when coupled with a concentration-based limit and an hourly limit. The pound per hour emission limitations that were part of the draft permit have been removed to minimize record keeping while preserving a cap on emissions. The hourly limits, paired with the concentration limits, insures that the annual emissions shall not exceed the level that was used in the ambient air quality analysis. The emissions used in the modeling analysis assumed the 15 ppmvd for NO_x and 25 ppmvd for CO at base load, providing the worst-case scenario. Finally, the CO concentration limitation has been revised from a three hour to a one hour rolling average to insure that the hourly CO standards are not violated.

Additionally, a condition was added limiting the emergency fire pump to a maximum of 250 hours of operation in any consecutive 12-month period. No annual emission limits were placed on the fire pump or the gas heater, however, for NO_x, CO or PM_{10}. Both the hourly and annual potential emission rates are relatively insignificant in comparison to the turbines. Additional limits and record keeping would be burdensome and provide no additional benefit to the environment.

The following table lists the maximum modeled impact as well as the significance level or RAL for NO_X, CO, PM_{10} and formaldehyde in units of micrograms per cubic meter ($\mu g/m^3$). For a detailed description of the modeling analysis, along with a discussion of additional impact analyses conducted, please see the attached memorandum, *Revised Aquila – Cass County Air Dispersion Modeling*, dated October 19, 2004.

Table 6: Maximum Modeled Concentrations

Pollutant	Maximum Modeled Impact ($\mu g/m^3$)	Significance Level/RAL ($\mu g/m^3$)	Time Period
NO_X	0.39	1.0	Annual
CO	76.34	2,000	1-hour
	24.83	500	8-hour
PM_{10}	2.59	5.0	24-hour
	0.05	1.0	Annual
Formaldehyde (CAS Number: 50-00-0)	0.024	0.8	24-hour
	0.0005	0.08	Annual

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (8), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

Lina Klein
Environmental Engineer

12/28/04
Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated March 26, 2004, received March 29, 2004, designating Aquila, Incorporated as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Kansas City Regional Office Site Survey, dated March 1, 2004.
- Stack tests submitted along with the application, dated March 26, 2004.
- Notification of facility name change, dated April 13, 2004.
- Revised permit application for new site, received September 13, 2004.

ATTACHMENT A: Operational Schedule of the Three Siemens-Westinghouse Model 501D5A Turbines

South Harper Peaking Facility
Cass County, S29/32, T45N, R32W
Installation ID Number: 037-0063
Project Number: 2004-03-143
Permit Number: _____

This sheet covers the period from _____ (month/year) to _____ (month/year).

Copy this sheet as needed.

Hours that Aquila is Producing Electricity = Electricity Hours		
A. Total Electricity Hours for this Month	(Note 1)	
B. 12-Month Total Electricity Hours From Previous Month's Worksheet	(Note 2)	
C. Monthly Total Electricity Hours From Previous Year's Worksheet	(Note 3)	
D. Current 12-Month Total Electricity Hours	(Note 4)	

Note 1: Total number of hours that this installation had any of the three or combination of the three turbines (Emission Points EP-01, EP-02, EP-03) connected to the utility grid by closure of the generator breaker.
Note 2: Running 12-month total of electricity hours from previous month's worksheet.
Note 3: Electricity hours reported for this month in the last calendar year.
Note 4: Amount reported in Note 2 minus amount reported in Note 3 plus amount reported in Note 1 (D = B – C + A). Less than 5,000 hours indicates compliance.

ATTACHMENT B: Individual Turbine Operational Schedule

South Harper Peaking Facility
Cass County, S29/32, T45N, R32W
Installation ID Number: 037-0063
Project Number: 2004-03-143
Permit Number: _____

This sheet covers the period from _____ (month/year) to _____ (month/year).

This sheet is for Turbine Emission Point EP-_____

Copy this sheet as needed.

Hours that a Turbine is Burning Natural Gas = Unit Gas Hours		
A. Total Unit Gas Hours for this Month	(Note 1)	
B. 12-Month Total Unit Gas Hours From Previous Month's Worksheet	(Note 2)	
C. Monthly Total Unit Gas Hours From Previous Year's Worksheet	(Note 3)	
D. Current 12-Month Total Unit Gas Hours	(Note 4)	

Note 1: Total number of hours that this turbine was burning natural gas for this month (unit gas hours).
Note 2: Running 12-month total of unit gas hours from previous month's worksheet.
Note 3: Unit gas hours reported for this month in the last calendar year.
Note 4: Amount reported in Note 2 minus amount reported in Note 3 plus amount reported in Note 1. (D = B – C + A)
Less than 2,000 hours indicates compliance.

ATTACHMENT C: Gas Heater Operational Schedule

South Harper Peaking Facility
Cass County, S29/32, T45N, R32W
Installation ID Number: 037-0063
Project Number: 2004-03-143
Permit Number: _____

This sheet covers the period from _____ (month/year) to _____ (month/year).

This sheet is for Turbine Emission Point EP-_____

Copy this sheet as needed.

A. Total Hours of Operation for this Month	(Note 1)	
B. 12-Month Total Hours of Operation From Previous Month's Worksheet	(Note 2)	
C. Monthly Total Hours of Operation From Previous Year's Worksheet	(Note 3)	
D. Current 12-Month Total Hours of Operation	(Note 4)	

Note 1: Total number of hours that the gas heater was operating for this month.
Note 2: Running 12-month total of operational hours from previous month's worksheet.
Note 3: Hours of operation reported for this month in the last calendar year.
Note 4: Amount reported in Note 2 minus amount reported in Note 3 plus amount reported in Note 1. (D = B – C + A)
Less than 6,000 hours indicates compliance.

ATTACHMENT D: Fire Pump Operational Schedule

South Harper Peaking Facility
Cass County, S29/32, T45N, R32W
Installation ID Number: 037-0063
Project Number: 2004-03-143
Permit Number: _____

This sheet covers the period from _____ to _____.
(month/year) (month/year)

This sheet is for Emission Point EP-_____

Copy this sheet as needed.

A. Total Hours of Operation for this Month	(Note 1)	
B. 12-Month Total Hours of Operation From Previous Month's Worksheet	(Note 2)	
C. Monthly Total Hours of Operation From Previous Year's Worksheet	(Note 3)	
D. Current 12-Month Total Hours of Operation	(Note 4)	

Note 1: Total number of hours that the fire pump was operating for this month.
Note 2: Running 12-month total of operational hours from previous month's worksheet.
Note 3: Hours of operation reported for this month in the last calendar year.
Note 4: Amount reported in Note 2 minus amount reported in Note 3 plus amount reported in Note 1. (D = B – C + A)
Less than 250 hours indicates compliance.

3.1.2 National Pollution Discharge Elimination System (NPDES) Missouri Construction Permit (Land Disturbance) and Stormwater Pollution Prevention Plan (SWPPP)

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

GENERAL PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.	MO-R106798
Owner:	Aquila, Inc.
Address:	20 West Ninth Street, Kansas City, MO 64106
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	South Harper Peaking Facility
Address:	24110 S Harper Road, Peculiar, MO 64708
Legal Description:	NE ¼, NE ¼, Sec. 32, T45N, R32W, Cass County
Receiving Stream:	Lake Annette (U)
First Classified Stream and ID:	S Grand River (P) (01249)
USGS Basin & Sub-watershed No.:	10290108-020003

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

All Outfalls

Construction or land disturbance activity (e.g., clearing, grubbing, excavating, grading, and other activity that results in the destruction of the root zone).

This permit authorizes only wastewater, including storm waters, discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

February 8, 2002
Effective Date

October 1, 2004
Issued Date

Stephen M. Mahfood, Director, Department of Natural Resources
Executive Secretary, Clean Water Commission

February 7, 2007
Expiration Date

James R. Mucy, Director, Kansas City Regional Office

MO 780-1481 (7-94)

APPLICABILITY

1. This general permit authorizes the discharge of storm water and certain non-storm water discharges from land disturbance sites that disturb one (1) or more acres over the life of the project or which is part of a larger common plan of development or sale that will disturb one or more acres over the life of the project. This general permit also authorizes the discharge of storm water and certain non-storm water discharges from smaller projects where the department has exercised its discretion to require a permit [10 CSR 20-6.200 (1)(B)].

   A Missouri State Operating Permit that specifically identifies the project must be issued before any site vegetation is removed or the site disturbed.

   Any site owner/operator subject to these requirements for storm water discharges and who disturbs land prior to permit issuance from MDNR is in violation of both State and Federal laws.

2. This permit authorizes non-storm water discharges from the following activities provided that these discharges are addressed in the permittee's specific Storm Water Pollution Prevention Plan (SWPPP) required by this general permit:
   a. De-watering activities if there are no contaminants other than sediment present in the discharge,
   b. Flushing water hydrants and potable water lines,
   c. Water only (i.e., without detergents or additives) rinsing of streets and buildings, and,
   d. Site watering to establish vegetation.

3. This permit does not apply to storm water discharges within 1000 feet of:
   a. Streams identified as a losing stream*,
   b. Streams or lakes listed as an outstanding national or state resource water*,
   c. Reservoirs or lakes used for public drinking water supplies (class L1)*, or
   d. Streams, lakes or reservoirs identified as critical habitat for endangered species.

4. This permit does not apply to storm water discharges:
   a. Within 100 feet of a permanent stream (class P) or major reservoir (class L2)*, or
   b. Within two stream miles upstream of biocriteria reference locations*.

5. This permit does not apply to storm water discharges where:
   a. Any of the disturbed area is defined as a wetland (Class W)*, or
   b. The storm water discharges to a sinkhole or other direct conduit to groundwater.

6. This general permit does not authorize the placement of fill materials in flood plains, the obstruction of stream flow, directing storm waters across private property not owned or operated by the permittee, or changing the channel of a defined drainage course. This general permit is intended to address only the quality of the storm water runoff and minimize off-site migration of sediments and other water contaminants.

7. This general permit does not authorize any discharge to waters of the state of sewage, wastewaters, or pollutants such as:
   a. Hazardous substances or petroleum products from an on-site spill or improper handling and disposal practices,
   b. Wash and/or rinse waters from concrete mixing equipment including ready mix concrete trucks unless such discharges are adequately treated and addressed in the Storm Water Pollution Prevention Plan, or
   c. Wastewater generated from air pollution control equipment or the containment of scrubber water in lined ponds, or
   d. Domestic wastewaters, including gray waters.

* Identified or described in 10 CSR 20, Chapter 7. These regulations are available at many libraries and may be purchased from MDNR by calling the Water Pollution Control Program.

APPLICABILITY (continued)

8. MDNR reserves the right to deny coverage under this general permit to applicants for storm water discharges from land disturbance activities at sites that have contaminated soils that will be disturbed by the land disturbance activity or where such materials are brought to the site to use as fill or borrow. Such activities are normally covered by a site specific permit.

9. If at any time the Missouri Department of Natural Resources determines that the quality of waters of the state may be better protected by requiring the owner/operator of the permitted site to apply for a site specific permit, the department may require any person to obtain a site specific operating permit [10 CSR 20-6.010 (13) and 10 CSR 20-6.200(5)].

   The department may require the permittee to apply for and obtain a site specific or different general permit if:

   a. The permittee is not in compliance with the conditions of this general permit;
   b. The discharge no longer qualifies for this general permit due to changed site conditions and regulations; or
   c. Information becomes available that indicates water quality standards have been or may be violated.

   The permittee will be notified in writing of the need to apply for a site specific permit or a different general permit. When a site specific permit or different general permit is issued to the authorized permittee, the applicability of this general permit to the permittee is automatically terminated upon the effective date of the site specific or different general permit, whichever the case may be. The permittee shall submit the appropriate Forms to the department to terminate the permit that has been replaced.

10. Any owner/operator authorized by a general permit may request to be excluded from the coverage of the general permit and apply for a site specific permit [10 CSR 20-6.010 (13) and 10 CSR 20-6.200(5)].

11. This permit is not transferable to other owners or operators unless all of the conditions listed in the "Transfer of Ownership" section are met.

EXEMPTIONS FROM PERMIT REQUIREMENTS

1. Facilities that discharge all storm water runoff directly to a combined sewer system are exempt from storm water permit requirements.

2. Linear, strip or ribbon construction, or maintenance operations as identified in 10 CSR 20-6.200 (1)(B), where water quality standards are not exceeded.

3. Sites that disturb less than one acre of total land area that are not part of a common plan or sale and that do not cause any violations of water quality standards and are not otherwise designated by the department as requiring a permit.

4. Agricultural storm water discharges and irrigation return flows. For purposes of this permit, land disturbance activities from Animal Feeding Operations (AFO) are not considered an agricultural activity and therefore not included in this exemption.

REQUIREMENTS AND GUIDELINES

Note: These requirements do not supersede nor remove liability for compliance with county and other local ordinances.

1. The discharge of storm water from these facilities shall not cause a violation of the state water quality standards, 10 CSR 20-7.031, which states, in part, that no water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:

   a. Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
   b. Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
   c. Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
   d. Waters shall be free from substances or conditions in sufficient amounts to have a harmful effect on human, animal or aquatic life.
   e. There shall be no significant human health hazard from incidental contact with the water;
   f. There shall be no acute toxicity to livestock or wildlife watering;
   g. Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
   h. Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles, or equipment and solid waste as defined in Missouri's Solid Waste Law, Section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to Section 260.200-260.247.

2. Good housekeeping practices shall be maintained on the site to keep solid waste from entry into waters of the state.

3. All fueling facilities present on the site shall adhere to applicable federal and state regulations concerning underground storage, above ground storage, and dispensers, including spill prevention, control and counter measures.

4. Substances regulated by federal law under the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) that are transported, stored, or used for maintenance, cleaning or repair shall be managed according to the provisions of RCRA and CERCLA.

5. An individual shall be designated by the permittee as responsible for environmental matters. Staff of the permitted facility shall inspect any structures that function to prevent pollution of storm water or to remove pollutants from storm water and of the facility in general to ensure that any Best Management Practices are continually implemented and effective.

6. All paint, solvents, petroleum products and petroleum waste products (except fuels), and storage containers (such as drums, cans, or cartons) shall be stored so that these materials are not exposed to storm water. Sufficient practices of spill prevention, control, and/or management shall be provided to prevent any spills of these pollutants from entering a water of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater.

EQUIREMENTS AND GUIDELINES (continued)

7. The primary requirement of this permit is the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) that

   a. Incorporates required practices identified below,
   b. Incorporates erosion control practices specific to site conditions, and
   c. Provides for maintenance and adherence to the plan.

   For new applicants, before removing any site vegetation, disturbing earth, or submitting an application, the permittee shall develop a SWPPP that is specific to the land disturbance activities at the site. This plan must be developed before a permit can be issued and made available as specified under RECORDS. However, the plan should not be submitted to the department unless specifically requested.

   The permittee shall fully implement the provisions of the SWPPP required under this part as a condition of this general permit throughout the term of the land disturbance project.

   The purpose of the SWPPP is to ensure the design, implementation, management, and maintenance of Best Management Practices (BMPs) in order to reduce the amount of sediment and other pollutants in storm water discharges associated with the land disturbance activities; comply with the Missouri Water Quality Standards; and ensure compliance with the terms and conditions of this general permit.

   The permittee shall select, install, use, operate, and maintain the BMPs in accordance with the concepts and methods described in the following documents:

   a. ***Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices,*** (Document number EPA 832-R-92-005) published by the United States Environmental Protection Agency (USEPA) in 1992. **This manual is available at The USEPA internet site:** http://cfpubl.epa.gov/npdes/pubs.cfm?program_id=0 **(searching under Publications/Policy and Guidance Documents).**

   b. ***Protecting Water Quality: A field guide to erosion, sediment and storm water best management practices for development sites in Missouri,*** published by the Missouri Department of Natural Resources in November 1995.

   The permittee is not limited to the use of these guidance manuals. Other commonly accepted publications may be used for guidance and must be referenced in the SWPPP if used. In addition, the permittee is not limited to the use of BMP identified in these manuals. However, any alternative BMPs should be justified by site conditions and described in the SWPPP.

8. SWPPP Requirements: The following information and practices shall be provided for in the SWPPP.

   a. Site Description. In order to identify the site, the SWPPP shall include the facility and outfall information provided in the Application Form. The SWPPP shall have sufficient information to be of practical use to contractors and site construction workers to guide the installation and maintenance of BMPs.

   b. Drainage areas: The following guidelines are for protection of drainage areas and shall be addressed in the SWPPP.
      i. Clearing and grubbing within 50 feet of a defined drainage course should be avoided.
      ii. Where changes to defined drainage courses occur as part of the project, clearing and grubbing within 50 feet of the defined drainage course should be delayed until all materials and equipment necessary to protect and complete the drainage change are on site.
      iii. Changes to defined drainage courses shall be completed as quickly as possible once the work has been initiated. The area impacted by the land disturbance of the drainage course change is to be revegetated or protected from erosion as soon as possible. Areas within 50 feet of defined drainage ways should be recontoured as needed and revegetated, seeded, or otherwise protected within five (5) working days after grading has ceased.

REQUIREMENTS AND GUIDELINES (continued)

8. SWPPP Requirements (continued)

b. Drainage areas (continued)
iv. Work in defined drainages or water courses may require a permit from the U.S. Army Corps of Engineers pursuant to Section 404 of the federal Clean Water Act.

c. Description of Best Management Practices: The SWPPP shall include a description of the BMPs that will be used at the site. The SWPPP shall provide the following general information for each BMP which will be used one or more times at the site:
i. Physical description of the BMP,
ii. Site and physical conditions that must be met for effective use of the BMP,
iii. BMP installation/construction procedures, including typical drawings, and
iv. Operation and maintenance procedures for the BMP.

The SWPPP shall provide the following information for each specific instance where a BMP is to be installed:
i. Whether the BMP is temporary or permanent,
ii. Where, in relation to other site features, the BMP is to be located,
iii. When the BMP will be installed in relation to each phase of the land disturbance procedures to complete the project, and
iv. What site conditions must be met before removal of the BMP if the BMP is not a permanent BMP.

d. Disturbed Areas: Slopes for disturbed areas must be defined in the SWPPP. Where soil disturbing activities cease in an area for more than 14 days, the disturbed areas shall be protected from erosion by stabilizing the area with mulch or other similarly effective erosion control BMPs. If the slope of the area is greater than 3:1 or if the slope is greater than 3% and greater than 150 feet in length, then the disturbed areas shall be protected from erosion by stabilizing the area with mulch or other similarly effective erosion control BMPs if activities cease for more than seven days. These requirements do not apply to the slopes of a sedimentation basin or the areas that clearly drain thereto.

e. Installation: The permittee shall ensure the BMPs are properly installed at the locations and relative times specified in the SWPPP. Peripheral or border BMPs to control runoff from disturbed areas shall be installed or marked for preservation before general site clearing is started. Storm water discharges from disturbed areas, which leave the site, shall pass through an appropriate impediment to sediment movement, such as a sedimentation basin, sediment traps, silt fences, etc. prior to leaving the land disturbance site. Bench marks shall be referenced for proper installation and operation and maintenance of drainage course changes.

f. Temporary and Permanent Non-Structural BMPs: The SWPPP shall require existing vegetation to be preserved where practical. The time period for disturbed areas to be without vegetative cover is to be minimized to the extent practical.

Examples of non-structural BMPs which the permittee should consider specifying in the SWPPP include: preservation of trees and mature vegetation, protection of existing vegetation for use as buffer strips (especially along drainage courses), mulching, sodding, temporary seeding, final seeding, geotextiles, stabilization of disturbed areas, preserving existing stream channels as overflow areas when channel straightening or shortening is allowed, soil stabilizing emulsions and tackifiers, mulch tackifiers, stabilized site entrances/exits, and other appropriate BMPs.

EQUIREMENTS AND GUIDELINES (continued)

8. SWPPP Requirements (continued)

g. Temporary and Permanent Structural BMPs: Examples of structural BMPs that the permittee should consider specifying in the SWPPP include: diverting flows from undisturbed areas away from disturbed areas, silt (filter fabric or straw bale) fences, earthen diversion dikes, drainage swales, sediment traps, rock check dams, subsurface drains (to gather or transport water for surface discharge elsewhere), pipe slope drains (to carry concentrated flow down a slope face), level spreaders (to distribute concentrated flow into sheet flow), storm drain inlet protection and outlet protection, reinforced soil retaining systems, gabions, temporary or permanent sediment basins, and other appropriate BMPs.

h. Sedimentation Basins: The SWPPP shall require a sedimentation basin for each drainage area with 10 or more acres disturbed at one time. The sediment basin shall be sized to contain 0.5 inch of sediment from the drainage area and to be able to contain a 2-year, 24-hour storm. The sediment shall be cleaned out of the basin and otherwise maintained as needed until the drainage area is stabilized. This requirement does not apply to flows from areas where such flows are properly diverted around both the disturbed areas and the sediment basin. Discharges from the basin shall not cause scouring of the banks or bottom of the receiving stream.

Where use of a sediment basin of this size is impractical, the SWPPP shall evaluate and specify other similarly effective BMPs to be employed to control erosion and sediment delivery. The SWPPP shall require the basin be maintained until final stabilization of the area served by the basin.

The SWPPP shall require both temporary and permanent sedimentation basins to have a stabilized spillway to minimize the potential for erosion of the spillway or basin embankment.

i. Additional Site Management BMPs: The SWPPP shall address other BMPs, as required by site activities, to prevent contamination of storm water runoff. Such BMPs include:
   i. Solid and hazardous waste management including: providing trash containers and regular site clean up for proper disposal of solid waste such as scrap building material, product/material shipping waste, food containers, and cups; and providing containers and proper disposal of waste paints, solvents, and cleaning compounds, etc.;
   ii. Provision of portable toilets for proper disposal of sanitary sewage;
   iii. Storage of construction materials away from drainage courses and low areas; and
   iv. Installation of containment berms and use of drip pans at petroleum product and liquid storage tanks and containers.

j. Permanent Storm Water Management: The SWPPP shall include a description of the measures that will be installed during land disturbance to control pollutants in storm water discharges that will occur after land disturbance activity has been completed. These could include drainage channels or systems; outlet control devices, detention basins, oil water separators, catch basins, etc. This general permit does not require the permittee or the permittee's contractors to operate or maintain these measures beyond the date of MDNR's Letter of Termination.

9. Amending/Updating the SWPPP: The permittee shall amend and update the SWPPP as appropriate during the term of the land disturbance activity. The permittee shall amend the SWPPP, at a minimum, whenever the:
   a. Design, operation, or maintenance of BMPs is changed;
   b. Design of the construction project is changed that could significantly affect the quality of the storm water discharges;
   c. Permittee's inspections indicate deficiencies in the SWPPP or any BMP;
   d. MDNR notifies the permittee of deficiencies in the SWPPP;
   e. SWPPP is determined to be ineffective in significantly minimizing or controlling erosion and sedimentation (e.g., there is visual evidence, such as excessive site erosion or excessive sediment deposits in streams or lakes);
   f. Total Settleable Solids from a storm water outfall exceed 2.5 ml/L/hr.; or
   g. MDNR determines violations of Water Quality Standards may occur or have occurred.

REQUIREMENTS AND GUIDELINES (continued)

10. Site Inspections Reports: The permittee shall ensure the land disturbance site is inspected on a regular schedule and within a reasonable time period (not to exceed 72 hours) following heavy rains. Regularly scheduled inspections shall be at a minimum once per week. For disturbed areas that have not been finally stabilized, all installed BMPs and other pollution control measures shall be inspected for proper installation, operation and maintenance. Locations where storm water leaves the site shall be inspected for evidence of erosion or sediment deposition. Any deficiencies shall be noted in a weekly report of the inspection(s) and corrected within seven calendar days of the inspection report. The permittee shall promptly notify the site contractors responsible for operation and maintenance of BMPs of deficiencies.

    A log of each inspection shall be kept. The inspection report is to include the following minimum information: inspector's name, date of inspection, observations relative to the effectiveness of the BMPs, actions taken or necessary to correct deficiencies, and listing of areas where land disturbance operations have permanently or temporarily stopped. The inspection report shall be signed by the permittee or by the person performing the inspection if duly authorized to do so.

11. Proper Operation and Maintenance: The permittee shall at all times maintain all pollution control measures and systems in good order to achieve compliance with the terms of this general permit.

    The need to halt or reduce the permitted activity in order to maintain compliance with general permit conditions shall not be a defense to the permittee in an enforcement action.

12. Notification to All Contractors: The permittee shall notify each contractor or entity (including utility crews and city employees or their agents) who will perform work at the site of the existence of the SWPPP and what action or precautions shall be taken while on site to minimize the potential for erosion and the potential for damaging any BMP. If additional land is disturbed or any BMP damaged, then the permittee shall cause to have the disturbance or damage repaired.

OTHER DISCHARGES

1. Hazardous Substance and Oil Spill Reporting: Refer to Section B, #14 of Part I of the Standard Conditions that accompany this permit.

2. Removed substances: Refer to Section B, #6 of Part I of the Standard Conditions that accompany this permit.

3. Change in discharge: In the event soil contamination or hazardous substances are discovered at the site during land disturbance activities, the permittee shall notify MDNR in writing.

SAMPLING REQUIREMENTS AND EFFLUENT LIMITATIONS

1. Discharges shall not violate General Water Quality Standards 10 CSR 20-7.031(3). Settleable Solids shall not exceed a maximum of 2.5 ml/L/hr. for each storm water outfall.

2. There are no regular sampling requirements in this permit. However, the department may require sampling and reporting as a result of illegal discharges, compliance issues, complaint investigations, or other such evidence of off-site contamination from activities at the site. If such an action is needed, the department will specify in writing any additional sampling requirements, including such information as location, extent, and parameters.

RECORDS

1. The permittee shall retain copies of this general permit, the SWPPP and all amendments for the site named in the State Operating Permit, results of any monitoring and analysis, and all site inspection records required by this general permit. The permittee shall retain these records at a site which is readily available from the permitted site until final stabilization of a site is achieved. The local office of the permittee, their contractor or consultant is considered to be readily available from the project site if it is located in the same county as the project site. The records shall be accessible during normal business hours. After final stabilization the records may be maintained at the location of the permittee's main office. The records shall be retained for a period of at least three years from the date of the Letter of Termination.

2. The permittee shall provide a copy of the SWPPP to MDNR, USEPA, or any local agency or government representative if they request a copy in the performance of their official duties.

3. The permittee shall provide those who are responsible for installation, operation, or maintenance of any BMP a copy of the SWPPP.

4. The permittee, their representative, and/or the contractor(s) responsible for installation, operation, and maintenance of the BMPs shall have a current copy of the SWPPP with them when on the project site.

TRANSFER OF OWNERSHIP

1. Individual Lot or Lots: Federal and Missouri storm water regulations (10 CSR 20-6.200) require a storm water permit and erosion control for one acre or more disturbed as part of a common plan or sale. When individual lots (commercial, industrial, or residential) are sold to an entity for construction (unless sold to an individual for purposes of building their own private residence) are also subject to storm water regulations because they are part of the common sale.

   The existing permittee who intends to transfer ownership of a lot or parcel of the overall permitted area is still responsible for the terms of this permit and erosion control on that site unless the new owner applies for and receives a separate Missouri State Operating Permit for storm water discharges from land disturbance activities. If the current permittee is to retain the permit and responsibility for control of sediment and other pollutants at the site, then the owner should obtain a copy of an Individual Lot Certification (ILC) from the lot owner(s).. The ILC should be properly completed and signed and retained with the SWPPP.

2. Entire Tract: If the entire tract is sold to a single entity, then this permit shall be terminated and the new owner shall submit an application for a new permit immediately.

TERMINATION

This permit may be terminated when the project is stabilized. The project is considered to be stabilized when either perennial vegetation, pavement, buildings, or structures using permanent materials cover all areas that have been disturbed. With respect to areas that have been vegetated, vegetative cover shall be at least 70% of fully established plant density over 100% of the disturbed area.

In order to terminate the permit, the permittee shall notify MDNR by submitting Form H, included with the State Operating Permit. The permittee shall complete Form H and mail it to MDNR at the address noted in the cover letter of this permit.

This general permit will expire five years from the effective date of the permit (see page 1). The issue date is the date the State Operating Permit is issued to the applicant. The expiration date may or may not coincide with the date the authorized project or development is scheduled for completion.

TERMINATION (continued)

If the project or development completion date will be after the expiration date of this general permit, then the permittee must reapply to the department for the permit to be re-issued. The permittee will receive notification of the expiration date of the permit before the expiration date listed on page 1 of this permit. In order for the permit to be re-issued, the permittee should submit the appropriate application form(s) at least 180 days before the expiration of the permit if land disturbance activity is expected to continue past the expiration date of this general permit.

If the permittee does not apply for the renewal of this permit, this permit will automatically terminate on the expiration date. Continued discharges from a site that has not been fully stabilized are prohibited beyond the expiration date; unless the permit is reissued or the permittee has filed a timely application for the reissuance of this permit.

DUTY TO COMPLY

The permittee shall comply with all conditions of this general permit. Any noncompliance with this general permit constitutes a violation of Chapter 644, Missouri Clean Water Law, and 10 CSR 20-6.200. Noncompliance may result in enforcement action, termination of this authorization, or denial of the permittee's request for renewal.

MAILING ADDRESS

The permittee shall send all written correspondence and forms, which are to be submitted to MDNR to the address listed in the cover letter that accompanies this permit.

Construction Phase
Storm Water Pollution Prevention Plan
(SWPPP)

for the

South Harper Peaking Facility
and Associated Construction Activities

in

Cass County
MISSOURI

for

Aquila

Burns & McDonnell
SINCE 1898

SWPPP OR NPDES

Construction Phase
Storm Water Pollution Prevention Plan
(SWPPP)

for the

South Harper Peaking Facility
Construction Activities

in

Cass County
Missouri

Prepared for:

AQUILA, INC.

37273

September 2004

by:

Burns & McDonnell Engineering Co., Inc.
Engineers-Architects-Consultants
Kansas City, Missouri

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

PART 1.0
INTRODUCTION

1.0 INTRODUCTION

1.1 THE CONSTRUCTION NPDES PERMIT AND SWPPP

The National Pollutant Discharge Elimination System (NPDES) general permit is for storm water discharges from construction activities that are classified as "associated with industrial activity" by U. S. Environmental Protection Agency (EPA) regulation. For construction projects that require the disturbance of more than one acre, the EPA requires that the project owner or contractor apply for a storm water permit under the NPDES program. For the purposes of the NPDES program, construction activities are defined as clearing, excavating, grading, or other land disturbing activities.

The State of Missouri is delegated by the EPA to administer the NPDES general permit for construction activities within the state that disturb one acre or more. A Missouri State Operating Permit (General Permit No. MO-R101000) for storm water discharges is required in accordance with Missouri regulation 10 CSR 20-6.200. Under the Missouri Clean Water Law, the Missouri Department of Natural Resources (MDNR), Division of Environmental Quality, Water Pollution Control Program requires Form E (Application for General Permit) and Form G or O (Application for Storm Water Permit) under the General Permit for Land Disturbance be submitted for permit issuance. A copy of the completed applications for this site along with the standard language for General Permit No. MO-R101000 can be found in Appendix E.

This document comprises the Storm Water Pollution Prevention Plan (SWPPP) required by the MDNR - Division of Environmental Quality. This SWPPP establishes a plan to manage the quality of storm water runoff from construction activities associated with the Aquila Inc. (Aquila) South Harper Peaking Facility project located in Cass County, Missouri. This SWPPP has been developed in accordance with requirements and guidelines specified within the General Permit for storm water discharges from land disturbance activities. This plan was written with the assistance of and information from the *U.S. EPA Storm Water Management for Construction Activities - Developing Pollution Prevention Plans and Best Management Practices* (EPA, 1993) and *Protecting Water Quality, A Field Guide to Erosion, Sediment and Storm Water Best Management Practices for Development Sites in Missouri and Kansas* (MDNR, 1999).

This plan is a guide to be used in the field to control erosion and sedimentation. The plan should be changed, updated, and revised as necessary throughout the construction project. Best management practices should be moved, added, or redesigned as necessary to control erosion and sedimentation to the maximum extent practicable.

1.2 PROJECT LOCATION AND DESCRIPTION

Aquila proposes to construct, own, and operate a nominal 315 megawatt (MW) peaking power plant to be located south of Peculiar, Missouri. Electric power will be generated by three, high-performance combustion turbine-generators fueled with natural gas. As a peaking power facility, the plant is expected to operate less than 5,000 hours per year, primarily on warm summer days when demand for electrical power is the highest. Development will also include a switchyard and associated infrastructure to provide additional electrical generating power during high demands of service.

This project is located in rural Cass County approximately 2 ½ miles south-southeast of Peculiar, Missouri. The physical address is 24110 South Harper Road, Peculiar, MO 64708. A vicinity map of the regional area (Figure 1-1) is located at the end of this Section.

1.3 PROJECT OWNER AND OPERATOR

The project owner and operator is Aquila Inc. The address is the following:

Aquila Inc.
20 West Ninth Street
Kansas City, MO 64106
(816) 421-6600

The contact for the project is Block Andrews, Project Manager. He can be reached at (816) 527-1354. Aquila will be in charge of all aspects of this project. The on-site construction manager for Aquila is Terry Hedrick. He can be reached at (816) 737-7854. John Stower is the project manager for Burns & McDonnell and can be contacted at (816) 822-3528.

1.4 CONTRACTOR/SUBCONTRACTOR CERTIFICATION

All contractors and subcontractors must sign a copy of the following certification statement before conducting any construction disturbances or providing professional services for the South Harper Peaking Facility project.

CONTRACTOR'S CERTIFICATION		
"I certify under penalty of law that I understand the terms and conditions of this Storm Water Pollution Prevention Plan and associated Missouri NPDES general permit that authorizes the storm water discharges associated with industrial activity from construction site identified as part of this certification".		
Signature	For	Responsible for
(Name) (Position) (Signature) (Date)	(Company) (Street / P.O. Box) (City, State, Zip) (Phone)	(Activity)
(Name) (Position) (Signature) (Date)	(Company) (Street / P.O. Box) (City, State, Zip) (Phone)	(Activity)
(Name) (Position) (Signature) (Date)	(Company) (Street / P.O. Box) (City, State, Zip) (Phone)	(Activity)

1.5 RETENTION OF RECORDS

Aquila must maintain a copy of this SWPPP on-site from the date of project initiation to the date of final stabilization. Aquila shall also retain copies of the SWPPP and all reports required by the General Permit for a period of at least three years from the date that the project is completed.

1.6 STANDARD PERMIT CONDITIONS

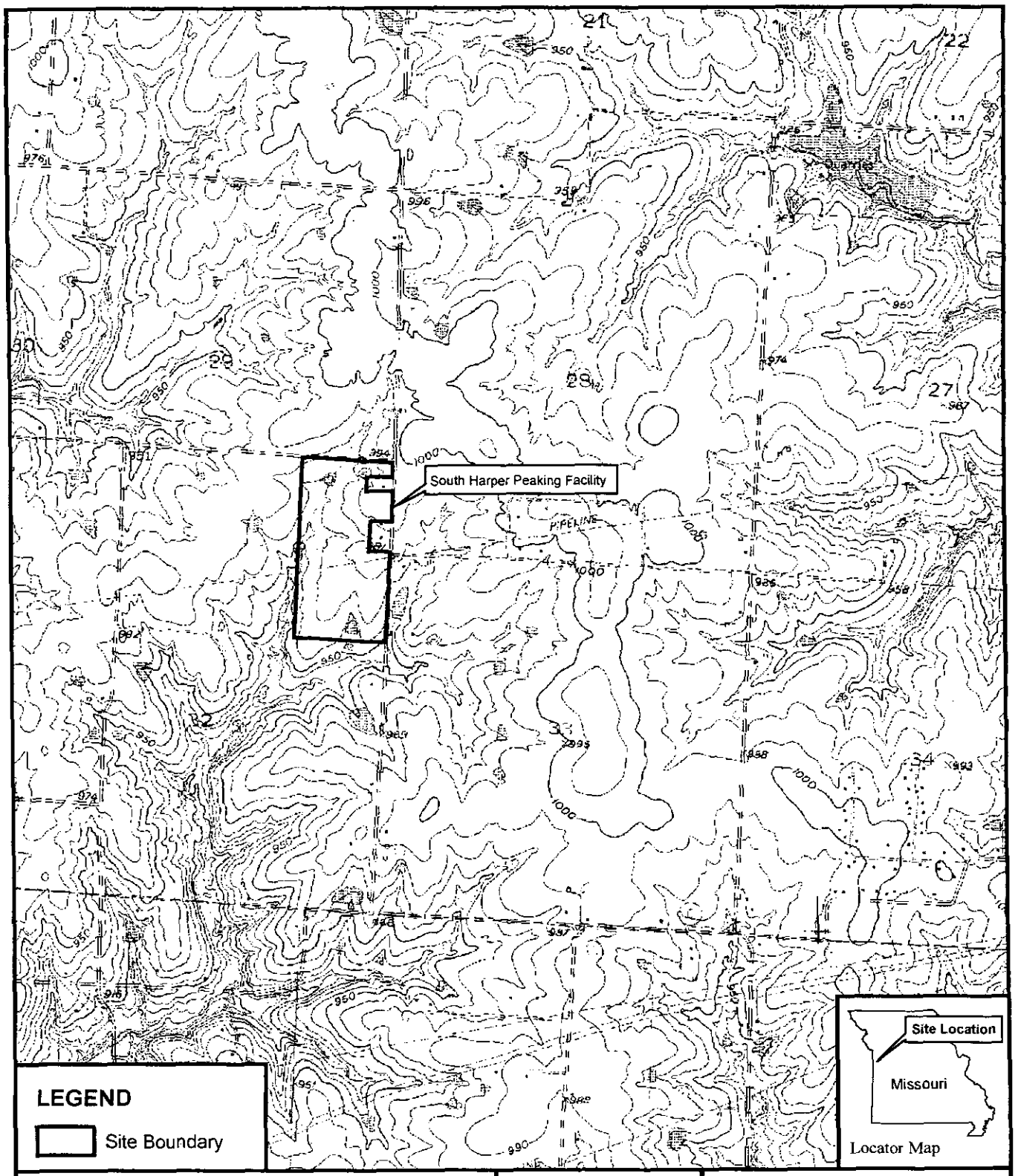
This section contains information on state and federal penalties for non-compliance with the permit as well as termination of coverage of the permit. Further explanation of these issues is stated under each individual heading.

1.6.1 Duty to Comply with Permit Conditions

The EPA and State of Missouri have substantial penalties for non-compliance with the permit. Any permit non-compliance constitutes a violation of the Clean Water Act and Missouri Clean Water Law and are grounds for enforcement action including: permit termination; revocation, reissuance, or modifications; or denial of permit renewal application. Individuals responsible for such violations are subject to criminal, civil and administrative penalties.

1.6.2 Final Stabilization and Termination of Coverage

Final stabilization is achieved when all soil-disturbing activities at the site have been completed and when a uniform perennial vegetative cover with a density of 70 percent or greater has been established or equivalent measures (such as the use of riprap, gabions, or other hardscape material) have been employed. When the site has been fully stabilized and all storm water discharges from construction activities that are authorized by this permit are eliminated, the project is then terminated. A Notice of Termination (Form H) will need to be filled out and submitted to MDNR to terminate the permit and discontinue any liability the owner or contractors would have on the construction site regarding erosion and sediment control.



Source: USGS 1:24,000 Topographic
Quadrangle: Peculiar, MO.

2,000 0 2,000 Feet

1 inch equals 2,000 feet

NORTH

Burns & McDonnell
SINCE 1898

Figure 1-1
Vicinity Map