Environmental Monitoring Plan

Advanced Flue Gas Desulfurization Project

Bailly Generating Station

January 1991

FINAL

Pure Air on the Lake Limited Partnership

FINAL
ENVIRONMENTAL MONITORING PLAN
(EMP)
FOR
BAILLY GENERATING STATION ADVANCED FLUE GAS

SUBMITTED TO
U.S. DEPARTMENT OF ENERGY
PITTSBURGH ENERGY TECHNOLOGY CENTER
P.O. BOX 10940

BY

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JANUARY, 1991

PURE AIR, NORTHERN INDIANA

BAILLY GENERATING STATION ADVANCED FLUE GAS
DESULFURIZATION PROJECT

ENVIRONMENTAL MONITORING PLAN
(EMP)

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTD)

TABLE OF CONTENTS (CONTD)

TABLE OF CONTENTS (CONTD)

TABLE OF CONTENTS (CONTD)

TABLE OF CONTENTS (CONTD)

SECTION

LIST OF TABLES

LIST OF TABLES (CONTD)

LIST OF TABLES (CONTD)

LIST OF FIGURES

CH/01

SECTION 1.0

INTRODUCTION

1.1 PURPOSE OF EMP

Pure Air and the Northern Indiana Public Service Company (Northern

Generating Station. The purpose of the EMP is to: (1) provide

the rationale for the scope and types of monitoring that will be

Energy (DOE) on February 16, 1990 and subsequently approved by DOE on

The environmental monitoring activities presented in the EMPO and EMP are based on expected project needs and current regulatory agency

change if regulatory agency requirements change. Therefore, the environmental media sampled, parameters analyzed, sampling and analytical

system's demonstration period. This will be reflected in revisions or amendments to the EMP.

1.2 SCOPE

1.2.1 CATEGORIES OF ENVIRONMENTAL MONITORING

However, the project will consider reporting any available off-site ambient air quality monitoring data during the 3-year demonstration period. Monitoring will be primarily for environmental characterization (Class I Monitoring) and compliance (Class II Monitoring) with regulatory agency

project. Because the AFGD system will be operated in accordance with all applicable governmental rules and regulations, there will be minimal supplemental monitoring (Class III Monitoring). The environmental characterization and compliance monitoring will minimize or negate the need for supplemental monitoring. These monitoring activities are described in more detail in Section 6.0 Environmental Monitoring.

1.2.2 DURATION OF ENVIRONMENTAL MONITORING

Environmental characterization monitoring will be performed prior to and during the 3-year demonstration phase of the project. Compliance monitoring will be performed during the 1-year

1.2.3 ENVIRONMENTAL MEDIA AND PARAMETERS

Table 1.2-1 shows the general environmental media and parameters to be monitored as part of the AFGD project. Both the media and parameters are dependent, in part, on the sample location. Additional details on the monitoring of environmental impacts

DESULFURIZATION PROJECT

ENVIRONMENTAL MEDIA AND PARAMETERS TO BE MONITORED

[redacted]

General/Metals[d], Radioactivity[e]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Ash	General/Metals, Corrosivity, Ignitability, Reactivity, TCLP Test, Indiana Neutral Leaching Method Test, Radioactivity, $CaCl_2$, $Ca(OH)_2$, $MgCl_2$, $CaSO_4 \cdot 2H_2O$, CaF_2
Wastewater Treatment	Corrosivity, Ignitability, Reactivity, TCLP Test, [redacted] and Grease, Chloride, TDS, Sulfate, Fluoride, BOD_5, pH, Calcium, Magnesium, Fecal Coliform, General/Metals
Air Emissions	SO_2, Percent Oxygen or Carbon Dioxide, Opacity, Particulate Matter, Air Metals[h], Unburned Hydrocarbons, Particle Size Distribution, SO_3/H_2SO_4, NO_x
Sound	dBA, Leq, Octave Band Spectrum

TABLE 1.2-1 (CONTD)

PURE AIR, NORTHERN INDIANA

BAILLY GENERATING STATION ADVANCED FLUE GAS DESULFURIZATION PROJECT

ENVIRONMENTAL MEDIA AND PARAMETERS TO BE MONITORED

[redacted]

g - The Indiana Neutral Leaching Method Test is the TCLP Test without the addition of acetic acid and includes the analyses for the following: Ba, B, Cl, Cu, Cn, F, Fe, Mn, Ni, Phenols, Na, SO_4, Sulfide as S, TDS, Zn, and pH.

[redacted] Pb, Mn, Ni, Se, Ag, and Zn.

The technical feasibility of performing some of the sampling and analyses, while still generating reliable data, is in doubt for

This may be reflected in revisions to the environmental media

reliable

interface cabinets throughout the ARGD facility that collect

The existing monitoring system consists primarily of coal

Program Selectees". The information provided in the EMP is based on

This Section 1.0 Introduction, provides information on the purpose and scope of the EMP. A summary has been included of the environmental media and parameters to be monitored and reported to DOE during the 3-year

The next three sections, Section 3.0 Existing Environment, Section 4.0 Consequences (Impacts) of the Project, and Section 5.0 Project Mitigation Measures, contain information from the Environmental Information Volume

discussion in these sections helps provide a basis for developing various aspects of the EMP.

The planned environmental monitoring activities for the AFGD project are presented in Section 6.0 Environmental Monitoring. The categories of

- Baseline Studies or Environmental Characterization (Class I Monitoring);
- Supplemental Environmental Impact Monitoring (Class III Monitoring).

These three classes of monitoring were specified in the previously mentioned DOE "Environmental Guidance Manual for Innovative Clean Coal

Technology Program Selectees". Subsequent to the issuance of this

(compliance monitoring) and Class II (supplemental monitoring). Monitoring Classes I and III used in the EMP are equivalent to the two scheme Class II (supplemental monitoring); whereas, Class II in the EMP

Both Pure Air and Northern Indiana, the project's proponents, will be

Integration of Monitoring Activities, contains information on the

The results of the environmental monitoring will be provided to DOE in quarterly reports with annual summaries and detailed reports. Section

and

for air emissions and wastewater discharges. The project is currently

these permits and their monitoring requirements, if any, will be

SECTION 2.0

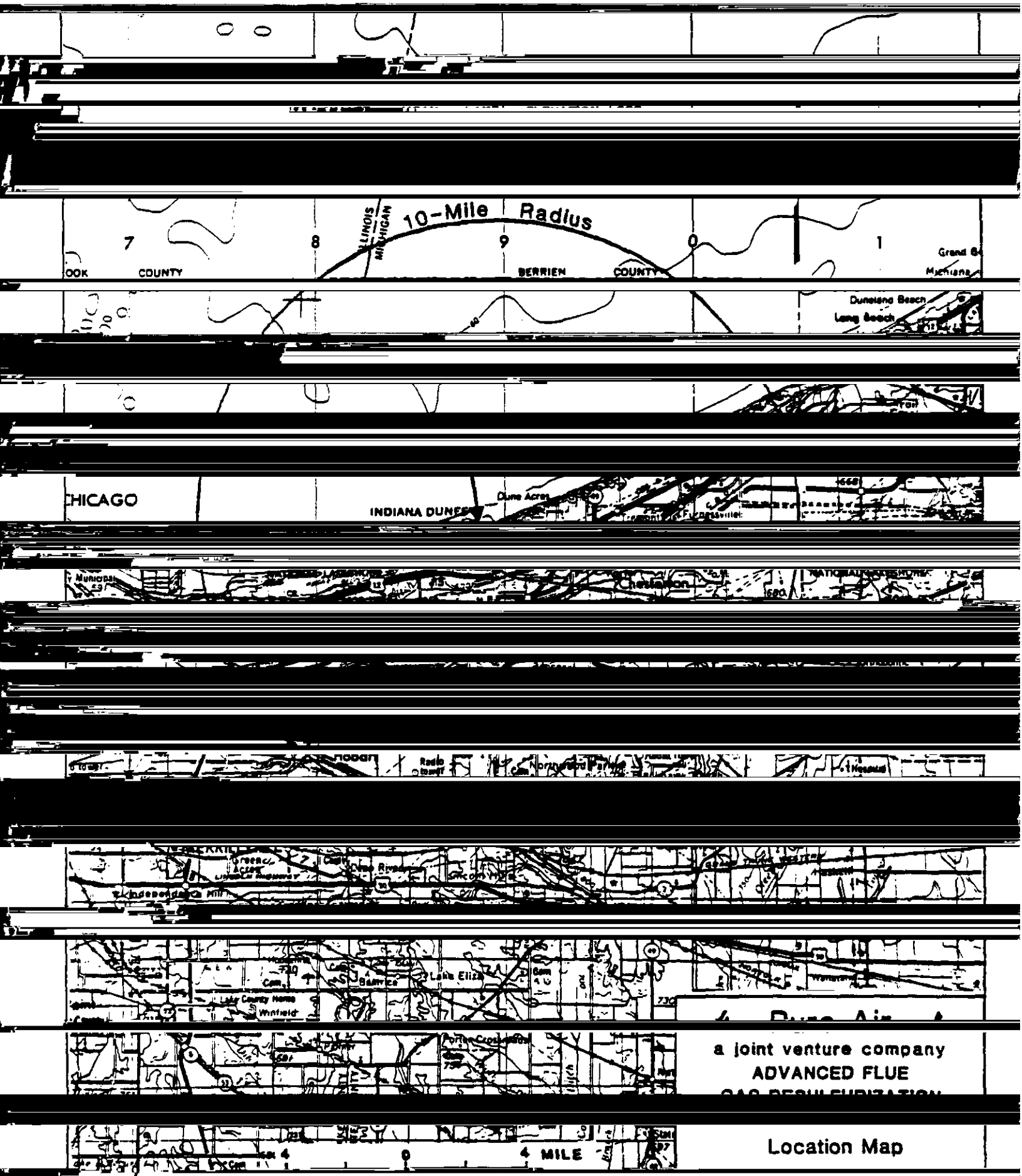
2.1 PROJECT PROPONENTS, PURPOSE AND LOCATION

The AFGD project will be a cooperative effort between Pure Air and

facility.

significantly reduce SO_2 emissions in an environmentally sound manner at a cost of approximately 50 percent of the cost of currently available Flue Gas Desulfurization (FGD) systems. This emission reduction will be shown to have the potential to be achieved without generating continuous solid or liquid waste disposal problems. The production of a by-product

liquid waste disposal problems will be demonstrated by a Wastewater



a joint venture company

ADVANCED FLUE

Location Map

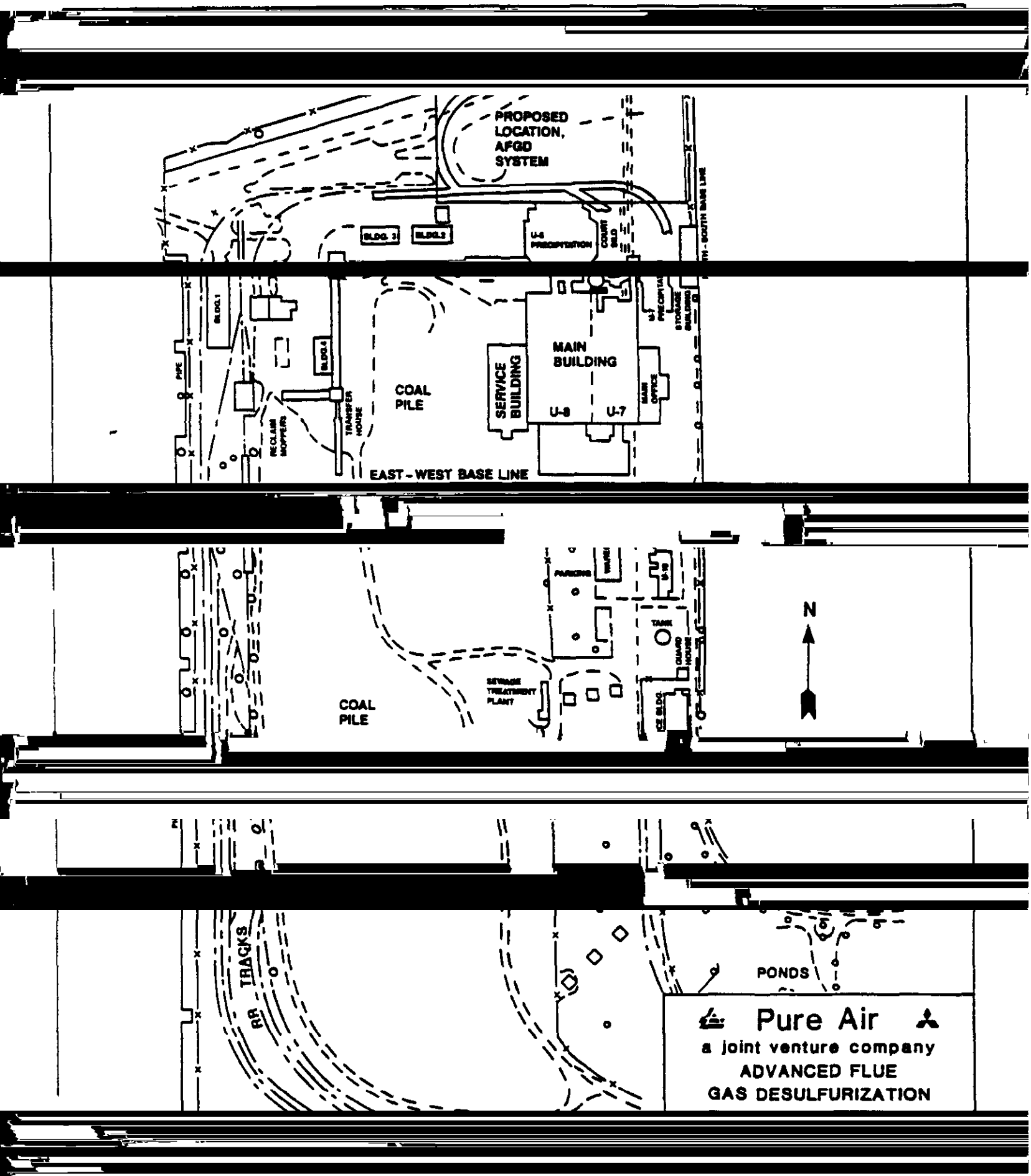


Figure 2.1-2 1/91

[redacted]

2.2 PROJECT PHASES

will comprise the demonstration period of the project; whereas, the

monitoring data that will be provided to DOE will be collected during the 3-year *demonstration phase of the project.*

2.3 PROJECT SCHEDULE

1. Last quarter 1988 through third quarter 1992 - Phase 1 Design and Permitting: Includes development of Environmental Information Volume (EIV) and Environmental Assessment (EA), developing design data, process engineering, detail engineering, equipment

and development of the EMPO and EMP.

3. Third quarter 1992 through third quarter 1995 - Phase 3 Demonstration Operation: Includes providing utilities for

reporting results of operation to the DOE.

4. Third quarter 1995 through 2012 - Phase 4 Commercial Operation: Includes compliance monitoring and commercial operation arrangement between Pure Air and Northern Indiana.

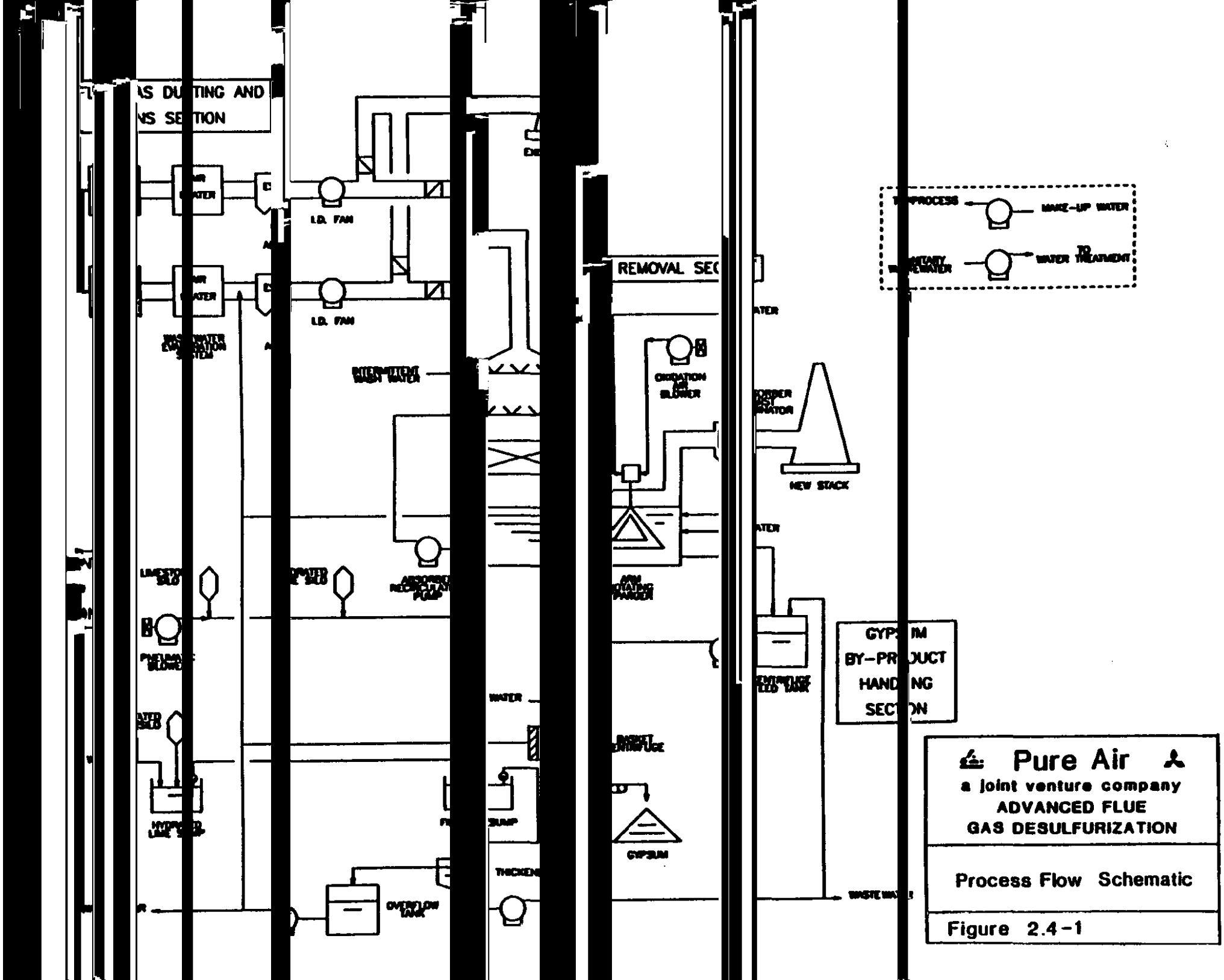
2.4 PROCESS DESCRIPTION

involves using Mitsubishi Heavy Industry's (MHI) basic wet limestone FGD technology on high sulfur United States coals to achieve high SO_2

exits through the stack;

- Gypsum By-Product Handling System where the gypsum slurry is reduced to dewatered cake containing 8 to 10 percent moisture by weight. Filtrate water is returned to the Absorber System, and a wastewater

join the main flue gas stream. Dry solids are removed by the ESP.


I.D. FAN
I.D. FAN
REMOVAL SEC
OXIDATION AIR BLOWER
NEW STACK
GYPSUM
OVERFLOW TANK
MAKE-UP WATER
TO WATER TREATMENT
GYPSUM BY-PRODUCT HANDLING SECTION
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a joint venture company
ADVANCED FLUE GAS DESULFURIZATION
Process Flow Schematic
Figure 2.4-1

2.5 EMISSIONS AND DISCHARGES

wastes generated during both construction and operation. These emissions

discussed in Section 6.2 Compliance Monitoring (Class II Monitoring) in relation to existing Bailly Station permit limits.

2.5.1 ATMOSPHERIC EMISSIONS

fugitive dust. Operational emissions of SO_2 will be reduced based on the AFGD system's expected performance. NO and

2.5.2 WASTEWATER DISCHARGES

Wastewater generated during construction will consist primarily of stormwater runoff. During operation a portion of the process

from the AFGD system and domestic wastes will be discharged to wastewater treatment systems.

not sold or off-specification, (3) normal construction waste materials, (4) solids from the wastewater treatment system, and

manufacturer requirements.

Gypsum Composition

Parameter	Weight Percent (Dry Basis)
$CaSO_4 \cdot 2H_2O$	93.0 min (95.0 expected)
$CaSO_3 \cdot 1/2\ H_2O$	2.0 max
SiO_2	2.5 max
Fe_2O_3	1.5 max
R_2O_3 (other metal oxides)	3.5 max
pH (units)	5 to 8
Free H_2O (percent)	10 max

The other metal oxides in the gypsum are expected to consist primarily of oxides of magnesium, sodium, and potassium.

2.6 EMISSIONS AND DISCHARGES CONTROL

The AFGD system will be constructed and operated in compliance with all

and solid waste disposal as described below.

2.6.1 ATMOSPHERIC EMISSIONS CONTROL

During construction fugitive dust will be controlled by good

truck traffic will be controlled by utilizing covered trucks and a weekly paved roadway water flushing program.

Operation of the AFGD system will control SO_2 emissions. NO_x and particulate emissions will be essentially the same as those currently emitted by the Bailly Station.

Management (OAM). Information on the Construction Permit is included in Section 6 Environmental Monitoring. The Operating

and will be applied for approximately 60 days before AFGD system start-up.

2.6.2 WASTEWATER DISCHARGES CONTROL

using runoff channels, straw bales or other suitable methods. The

water. The domestic sewage or sanitary wastes will consist of

sewage treatment facility.

[redacted]

in operation this wastewater will be directed to a wastewater

[redacted]

the bleed stream will be routed to the WES with the remainder sent to the wastewater treatment system.

The discharge of wastewater from the AFGD system will be in compliance with a modification to the Bailly Station's National

[redacted]

the IDEM, Office of Water Management (OWM) as discussed in Section

[redacted]

[redacted]

(e.g., wallboard) as previously indicated. Gypsum not sold, including off-specification gypsum, will be landfilled.

[redacted]

Environmental Monitoring.

SECTION 3.0

EXISTING ENVIRONMENT

environment was described in the vicinity of the Bailly Generating Station.

Land Resources Water Resources Ecological Resources Socioeconomic

3.1 ATMOSPHERIC RESOURCES

3.1.1 SITE METEOROLOGY

cold, dry winters and warm, moist summers. These climatic characteristics are the result of storms moving eastward along the northern tier of the United States and storms in the southwest moving toward the Great Lakes. The average temperature for the area is approximately 50°F, with the highest temperatures occurring

Indiana (4 miles southwest of the Station) are -21°F and 104°F (Gale Research Company, 1985).

As indicated above, the area is known for frequent high winds,

1° longitude sector containing the plant site. Using the Thom

Indiana at the Dune Acres substation (3 miles southeast of

the Bailly Station) are shown in Figure 3.1-1 and indicate that the

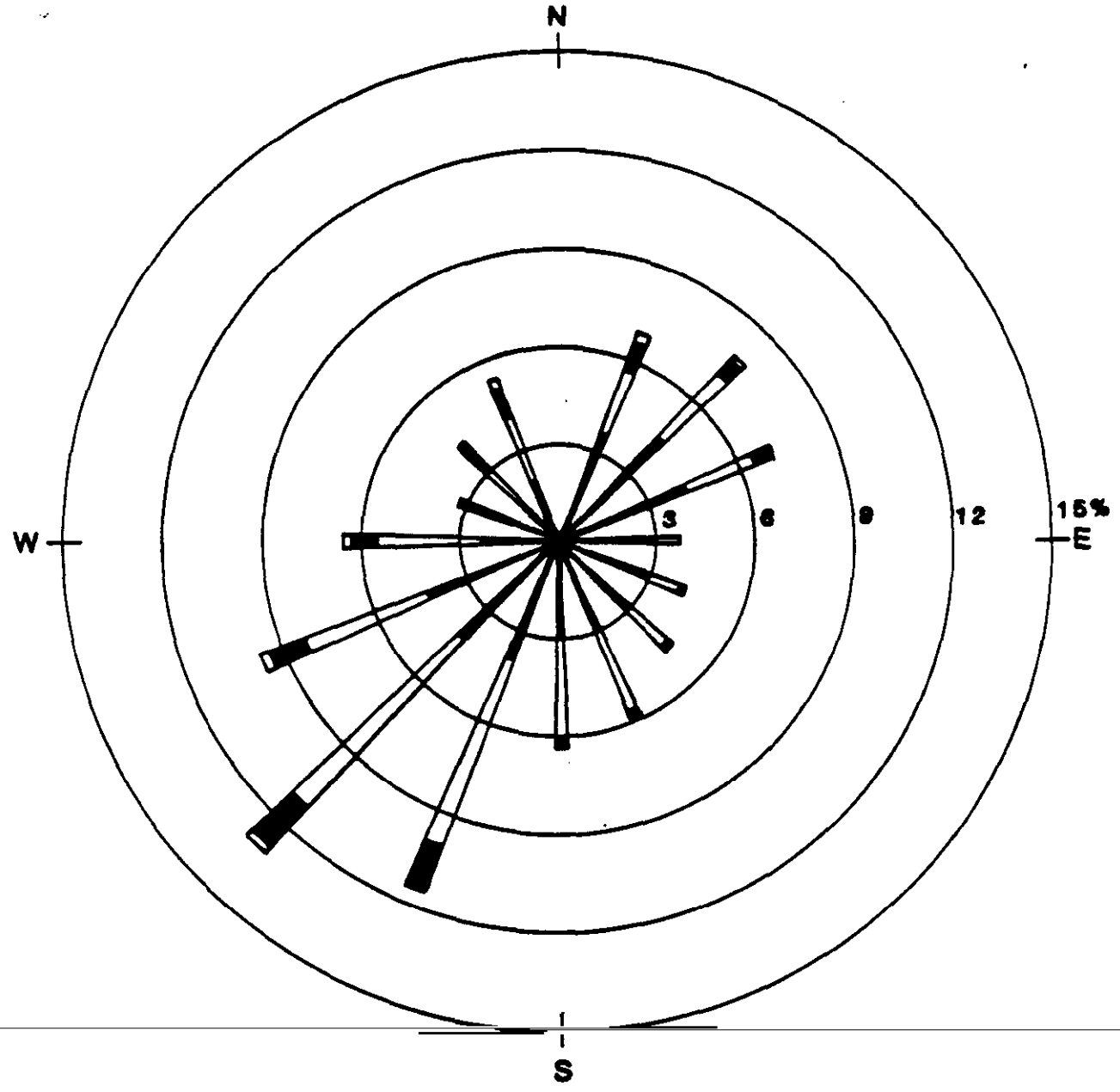
There are important climatological differences between dune areas, which include the plant site, and more urban inland areas. The

area. The area (Porter County) is presently classified as

pollutants (SO_2, NO_2, CO and PB) are in attainment. It is of

Recently, IDEM conducted a study to develop a control strategy to attain the National Ambient Air Quality Standards (NAAQS) for SO_2. The result of this study indicated that the NAAQS for SO_2 are being met, however, the concentrations predicted were very

As indicated above, the area is currently designated as "attainment" or unclassifiable for all criteria pollutants except



1-3 4-6 7-10 11-16 17-21 >21

Note:

GAS DESULFURIZATION

Figure 3.1-1 1/91

Northern Indiana has collected air-quality data at the Bailly

SO_2 monitoring sites. Northern Indiana does not currently

exceed 40 percent.

the period August, 1988 through August, 1989, the Station's average

3.2 LAND RESOURCES

3.2.1 GEOLOGY

TABLE 3.1-1

PURE AIR, NORTHERN INDIANA
BAILLY GENERATING STATION ADVANCED FLUE GAS
DESULFURIZATION PROJECT

1988 MONITORING DATA FOR PM10, SO_2,
AND NO_x *NEAR BAILLY GENERATING STATION*

[redacted]

24-Hr	Bethlehem		73	150
Annual[b]	Steel		32	50
SO_2				
3-Hr	Dune Acres	1.4 mi SE	430[a]	1,300
[redacted]			[redacted][a]	
NO_x				
[redacted][c]				

Ill.

Footnotes:
[a] - Second highest concentration.
[b] - Geometric mean.
[c] - Arithmetic mean.

Source: Ritter, K. September 13, 1989. Indiana Department of [redacted] data report sent to M. Mitckes, EBASCO, Oak Ridge, Tennessee.

The geology at the southern shore of Lake Michigan represents a complex history of glacial, shallow-water coastal, lake, wetland, and beach/dune sedimentation that began during and after the final

approximately 4,000 ft thick. The thickness of this lowermost

The middle unit consists of an assemblage of interbedded till, glacial/lake clay, sand, and gravel. This unit crops out in the region as the Lake Border Moraine (Figure 3.2-1). The glacial/lake deposits are well developed northward within this unit where it extends under Lake Michigan and the till deposits of the middle

exposed on the surface of the Lake Border Moraine, whereas the core consists of till interbedded sand and gravel.

form the Glenwood, Calumet and Tolleston Beaches, and interridge marshes. This series of the beach/dune complexes began forming between 14,500 and 12,400 years ago in response to rises and falls

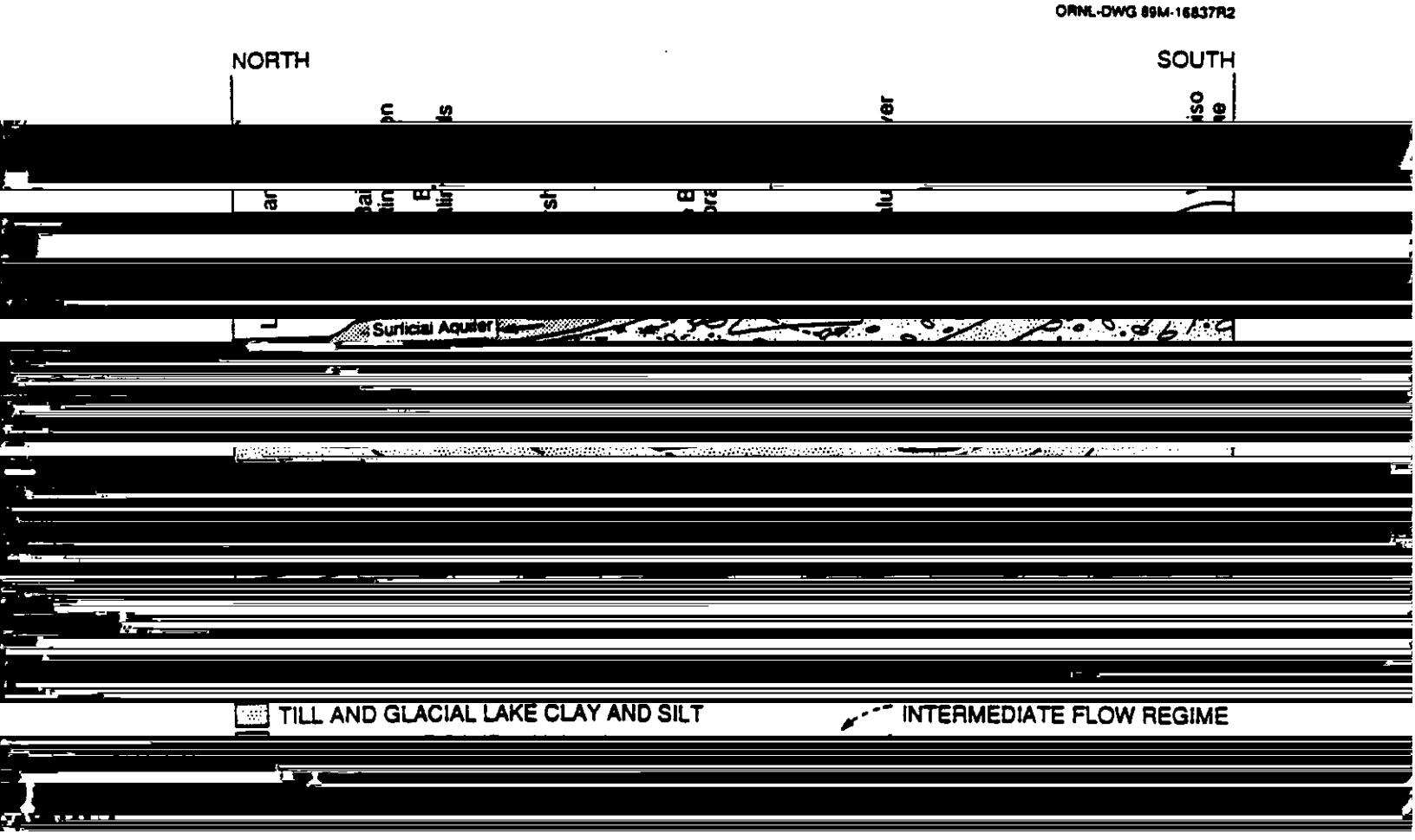


Figure 3.2-1. Cross-section perpendicular to the Lake Michigan shoreline showing geology and groundwater movement near the Bailly Generating Station.

3.2.2 SEISMOLOGY

The Bailly Station is located in an area of minor seismic activity

have been reported for epicenters within 100 miles of the Station.

Soils located in the vicinity of the station are composed primarily of five types: Oakville fine sand, Houghton muck, Adrian muck, Maumee loamy fine sand, and Dune land. The large portion of ground used for industrial purposes in the area is classified as cut and fill. This is illustrated in Figure 3.2-2, "Soil Composition - Bailly Generating Station Area."

The soils of the subdunal area and interdunal ponds are composed

TABLE 3.2-1

PURE AIR, NORTHERN INDIANA
BAILLY GENERATING STATION ADVANCED FLUE GAS
DESULFURIZATION PROJECT

MODIFIED MERCALLI SCALE

I. Not felt except by a few under especially favorable circumstances.

II. [redacted]

III. Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing automobiles may rock slightly. Vibration like passing of truck. Duration estimated.

IV. [redacted]

V. Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbance of trees, poles, and other tall objects

VI. [redacted]

structures; considerable in poorly built or badly designed

TABLE 3.2-1 (CONTD)

PURE AIR, NORTHERN INDIANA
BAILLY GENERATING STATION ADVANCED FLUE GAS
DESULFURIZATION PROJECT

MODIFIED MERCALLI SCALE

VIII. [redacted]

structures. Fall of chimneys, factory stacks, columns, monuments, [redacted]

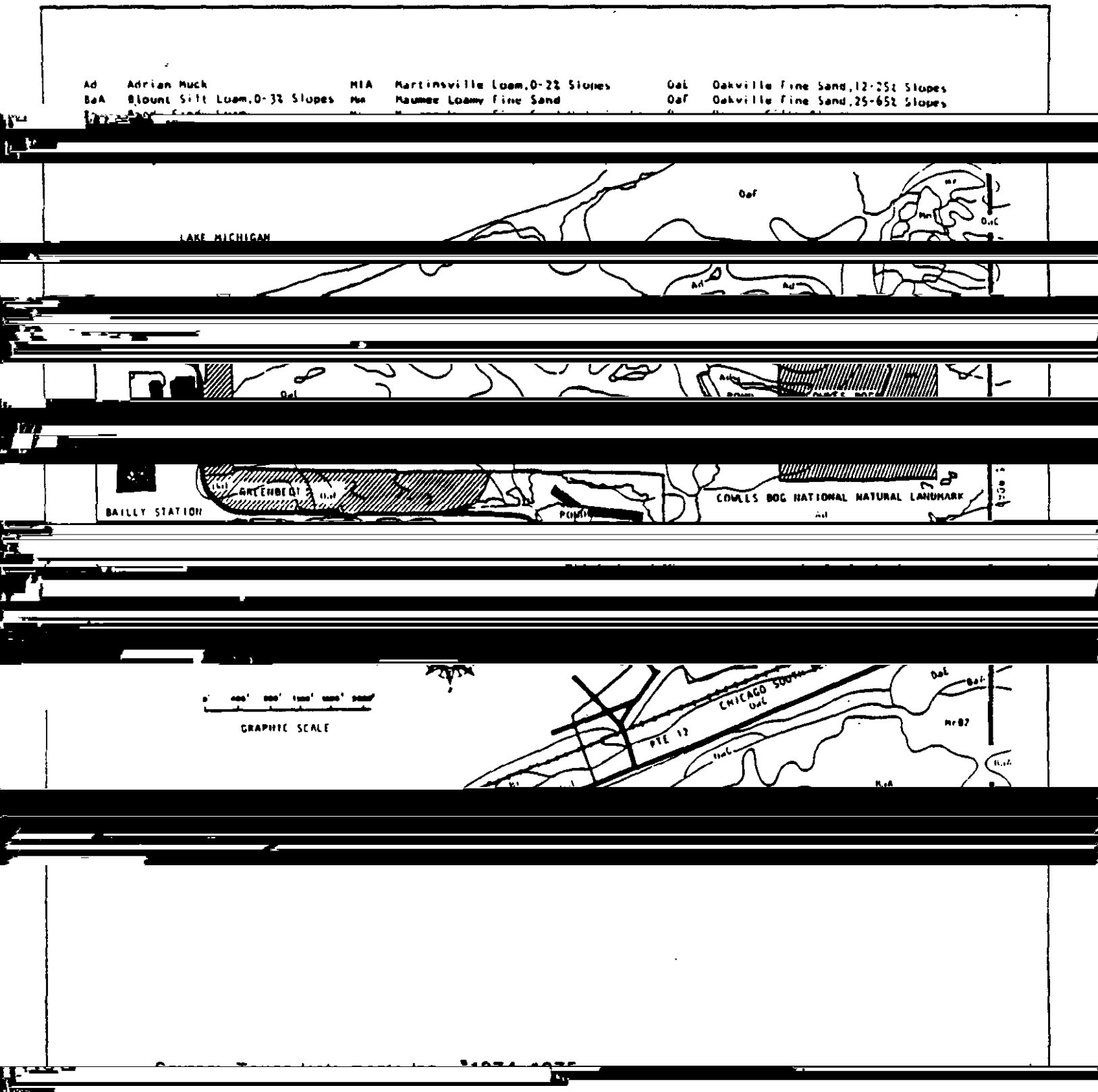
IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plum; great in substantial [redacted]

X. Some well-built wooden structures destroyed; many masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.

XI. Few, if any, (masonry) structures remain standing. Bridges [redacted]

ground. Rails bent greatly.

XII. Damage total. Waves seen on ground surfaces. Lines of sight and level distorted. Objects thrown upward into the air.



GAS DESULFURIZATION

Figure 3.2-2 1/91

Soils at the southern end of the subdunal area are composed of

Dune land occupies the area extending inland from the shore of Lake

species.

3.2.4 LAND USE

The station is bordered on the south and west by the Bethlehem Steel Corporation's Burns Harbor complex. The Indiana Dunes National Lakeshore borders the site to the east and the south.

Chicago, all of which are centers of heavy industry. Steel manufacturing is the major industry in Gary,

Very little of the land north of U.S. Route 12 is either suitable

station.

3.3 WATER RESOURCES

3.3.1 GROUNDWATER

There are three major aquifers (basal, subtill and surficial)

Generating Station (Figure 3.2-1). The lowermost basal sand

clay. The subtill aquifer is part of Thompson's (1987) middle unit

Generating Station is the surficial aquifer which consists of lake, beach and dune sand deposits. The surficial aquifer is developed in all areas adjacent to the Station, except where glacial moraines

Generating Station, the surficial aquifer is over 50 ft thick.

Groundwater flow in the region may be divided into regional,

leakage into drainage systems in the Great Marsh.

Local flow systems within the surficial aquifer are recharged in the dunebeach complexes and discharge into streams, ditches, and ponds in the interdunal wetlands. The shallow groundwater flow

beach complexes. Shallow groundwater flows northward and southward from these divides and discharges into adjacent low-lying areas and

(Figure 3.2-1). The shallow groundwater flows directly into Lake

From 1967 to 1980, fly-ash produced during operation of the Bailly Generating Station was collected by ESPs and transported as a slurry to a series of unlined settling ponds located on the

evaluation of monitoring wells in the area, Meyer and Tucci (1979)

In late 1979, the Station discontinued use of the easternmost

by lining with a 1 ft thick layer of clay and a 0.12 inch thick

[redacted]

(confined aquifers) beneath the Station.

[redacted]

within 1-mile of the station, and a total of three wells at a

[redacted]

depth of about 30 ft, approximately 300 ft from the shoreline of

[redacted]

found in groundwater throughout the Bailly Station area. This indicates that a portion of the groundwater originates from the percolation of rain and surface water through the sandy soils of the dune forests and through the bogs and peaty areas in the region.

3.3.2 SURFACE WATER

There are a number of springs, streams, rivers, and bogs in the

the Indiana Dunes National Lakeshore. Some marshy areas to the east and south of the Bailly Station empty into Lake Michigan via

Burns Ditch to the west of the Station is one ditch of an extensive system of ditches that were constructed to facilitate drainage.

introduced into the lake use Burns Ditch for access to their spawning grounds in the Little Calument River.

lowest in late winter and early spring. The lake is divided into two basins by two parallel ridges running in an easterly direction

the shore of the southern basin.

The Lake Michigan beach water zone is the portion of water that extends from shore to a depth of 30 feet. It is a subarea of the

Over a 5-year study (March, 1974 to December, 1978), lake temperatures ranged from 37.4° to 73.4°F. Ice may cover the

Lake Michigan has two circulation periods each year, with overturns occurring early winter and early spring in the southern basin.

almost complete and the lake approaches an isothermal temperature

somewhat.

velocities in the upper layer measured at the Station were 40 cm/s. Seiches occur occasionally at the southern end of the lake.

Bailly Generating Station and associated AFGD System are above the

100-year flood elevation.

Bailly Station. In addition, the current habitats or migratory patterns of wildlife will not be disturbed in any way by the proposed construction of the AFGD System.

3.4.1 TERRESTRIAL

(former farmland) and associated forest components further inland. Each of these areas has its particular floral composition and

TABLE 3.3-1

PURE AIR, NORTHERN INDIANA
BAILLY GENERATING STATION ADVANCED FLUE GAS
DESULFURIZATION PROJECT

LAKE MICHIGAN FLOOD ELEVATIONS
(NATIONAL GEODETIC VERTICAL DATUM - 1929)

10-Year	50-Year	100-Year	500-Year
583.0	583.9	584.2	584.8

[redacted]

Source: Federal Emergency Management Agency, 1991.

[redacted]

faunal components, although larger animals can be expected to move freely from place to place. The Cowles and Pinhook Bogs, within the National Lakeshore Boundaries, are two intensively studied bogs; they are typical of other bogs and wetlands within the

principally by insects that feed on carrion (fish and birds) cast up on the shoreline. These insects in turn are preyed upon by shore birds and other insects. Plant life per se is essentially

The area in the Bailly Station where the AFGD system will be constructed contains only a small amount of vegetation on the north-facing slope. Some of this area will be filled during

species.

3.4.1.1 Vegetation

In the vicinity of the Baily Station the mid-beach supports a few hardy pioneer plant species (i.e., coarse plants such as the cocklebur and sea rocket). Immediately adjacent to this

these plants and other grasses are typical of a beach

such an ecosystem.

The dune line (foredune) has both active and temporarily

more stable foredunes are shrubs, such as cherry and little

forest stands of small black oak, jack pine, large tooth

and bittersweet predominate and are interspersed with

with bearberry, common junipers, cottonwood, and willow which provide good vertical and horizontal wind shielding.

Forest communities are adjacent to the dunes. The canopy trees are almost all black oak, although basswood is occasionally present. Oak seedlings, wild cherry, sassafras, and witch hazel comprise the understory. The oak forest is

has older oaks and a more spotty distribution of herbaceous plants and woody shrubs. Shade-tolerant forms such as bracken fern live under the oaks. There are open areas of sand which are stabilized by sedges and little bluestem grasses. In general, as one goes inland the soils become

higher water and nutrient retention than the dunes. The forests provide diverse microhabitats in the rotting logs, fallen leaves and branches of the forest litter.

The National Lakeshore has a native stand of predominantly

oaks are occasionally found in this forest habitat with some

12 additional tree species. Most of the saplings are

Old field habitats exist within the boundaries of the National Lakeshore and ponds are common in the sand dunes. Old field vegetational types are characteristically mosses, sedges and grasses, cattails and herbs, and maple, cherry and oak seedlings.

mats of sphagnum moss surrounding areas of open water. Other

3.4.1.2 Vertebrates

Vertebrates in the Bailly Generating Station area include

woodchuck. Scats (animal feces) or footprints of deer, raccoon and fox also have been observed in the area.

Lower vertebrates encountered in the Station area include the red backed salamander, green frog, wood frog, garter snake,

summer residents, six are winter residents, and 26 are

Lakeshore; however, it has been established that the species

Within the vicinity of the Bailly Station are flyways (migration corridors) of several types of migratory waterfowl, including the "dabbling ducks" (e.g., mallard, black duct and pintail), the "diving ducks" (e.g., redhead

the

near shore waters of the lake and in the interdunal ponds near the lake.

Lake Michigan shoreline of the Chicago-Hammond-Gary area, the

zooplankton, and phytoplankton as described below.

TABLE 3.4-1

PURE AIR, NORTHERN INDIANA
BAILLY GENERATING STATION ADVANCED FLUE GAS
DESULFURIZATION PROJECT

ABUNDANT BIRD SPECIES KNOWN TO NEST
IN THE INDIANA DUNES AREA

Common Name	Common Name
[redacted]	[redacted]
Mallard	Red-Eyed Vireo
[redacted]	[redacted]
Sora	Ovenbird
Common Gallinule	Common Yellowthroat
American Coot	American Redstart
Killdeer	House Sparrow
American Woodcock	Bobolink
[redacted]	[redacted]
Yellow Billed Cuckoo	Brown-Headed Cowbird
[redacted]	[redacted]
Downy Woodpecker	American Goldfinch
[redacted]	[redacted]
[redacted]	[redacted]
Eastern Wood Peewee	Song Sparrow
Horned Lark	Tufted Titmouse
Tree Swallow	House Wren
Bank Swallow	Marsh Wren
Barn Swallow	Gray Catbird
[redacted]	[redacted]

3.4.2.1 Fish

Fourteen fish species in seven families have been verified in Lake Michigan and several ponds near the

and salmonids comprised the third largest number of

rare or endangered fish species in the aquatic community (Lake Michigan, rivers, bogs, marshes, streams, ponds) in the Bailly Station vicinity. Table 3.4-2 lists the fish species identified in the area.

The Bailly Station's thermal plume in Lake Michigan

yellow perch, bluegill, and large mouth bass. Several species of minnows and two species of suckers also have been found in the area. These fish are important as forage for the game species, but are not sought after for sport or food. Five species of importance for sport or food, especially in the spring, are coho salmon, lake trout, steelhead trout, chinook salmon, and alewives. Other fish of marginal importance, such as carp, bullhead, and goldfish, may also appear near the Station.

Three fish species have been found in ponds in the Bailly

most abundant species.

TABLE 3.4-2

PURE AIR, NORTHERN INDIANA
BAILLY GENERATING STATION ADVANCED FLUE GAS
DESULFURIZATION PROJECT

FISH SPECIES VERIFIED IN THE AQUATIC COMMUNITY

Scientific Name	Common Name
Family Clupeidae	Herring Family
Dorosoma cepedianum	Gizzard Shad
Alosa pseudoharengus	Alewife
Family Salmonidae	Salmon, Trout and Whitefish Family
Oncorhynchus tschawytscha	Chinook Salmon
Oncorhynchus kisutch	Coho (Silver) Salmon
Salmo trutta	Brown Trout
Family Umbridae	Mudminnow Family
Umbra limi	Central Mudminnow
Family Cyprindae	Minnow Family
Cyprinus carpio	(European) Carp
Notropis hudsonius	Spottail Shiner
Family Centrarchidae	Sunfish Family
Leponis cyanellus	Green Sunfish
Family Percidae	Perch Family

3.4.2.2 Benthic Macroinvertebrates

The hard sand bottom and seasonal water temperatures along

bottom sediments and have been estimated to comprise slightly more than half of the total benthic organisms present. Some species are highly pollution tolerant. Most of the other species of benthic organisms are of a type characteristic of conditions elsewhere in the lake and include leeches, fingernail clams, scuds, and midge larvae.

Table 3.4-3 identifies the macroscopic animals native to

surround the Bailly Station site.

3.4.2.3 Zooplankton

noted that during this study, zooplankton samples were

TABLE 3.4-3

BAILLY GENERATING STATION ADVANCED FLUE GAS

Family Name	Common Name
Libellulidae	Dragonflies
Coenagrionidae	Damselflies
Corixidae	Water Boatmen
Nepidae	Water Scorpions
Gerridae	Water Striders
Mesoveliidae	Water Treaders
Lymnaeidae	Pond Snails
Aeschnidae	Dragonflies
Notonectidae	Backswimmers
Hebridae	Velvet Water Bugs
Gyrinidae	Whirligig Beetles
Hydrophilidae	Water Scavenger Beetles
Chrysomelidae	Leaf Beetles
Gammaridae	Scuds
Hydracarina	Water Mites
Physidae	Pouch Snails
Hirudinea	Leeches
Chironomidae	Midges
Veliidae	Smaller Water Striders
Dytiscidae	Predaceous Diving Beetles
Planorbidae	Orb Snails
Sphaeriidae	Fingernail Clams
Haliplidae	Crawling Water Beetles
Astacidae	Crayfish
Elmidae	Riffle Beetles
Naucoridae	Creeping Water Bugs

Source: Krekeler, C.H., et al. 1981. Exosystem Study of the Indiana Dunes National Lakeshore, Vols. One and Two.

collected on one day only). Of these, Bosmina longirostris and copepod copepodids were the most abundant

occurring regularly included Cyclops bicuspidatus thomasi, Daphnia retrocurva (lake stations), and Chironomidae larvae (pond stations). Numerical density ranges from 0.44 to 117.79 organisms/liter in the lake and 50.00 to 964.74 organisms/liter in the sampled ponds, an indication of the higher productivity in the ponds. Spatial and temporal statistical differences were detected between groups of zooplankton stations and reflect the changing

quantitative distribution indicates that these microcrustaceans were over three times more abundant

suggest that certain species of zooplankton are either seeking out the warmer water of the plume, reproducing

the two factors.

A large portion of the zooplankton found in the thermal plume had large infestations of fungus on their bodies. This was especially apparent in Eurytemora affinis and

plume did not exhibit any infestations of fungus.

sometimes occurs in polluted areas such as in southern Green Bay.

3.4.2.4 Phytoplankton

Phytoplankton populations in Lake Michigan reflect seasonal changes in available light, temperature, nutrients and predation. Diatoms dominate the lake flora [redacted] become briefly dominant in late spring, and green algae [redacted]

Productivity levels in the lake are very low, particularly as compared to nearby river systems. Productivity levels in the ponds are somewhat higher but still within a low range. A relationship between productivity, biovolume and [redacted] phytoplankton population.

[redacted] Peridinium sp. are the more abundant dinoflagellates. These forms have been previously reported from Lake Michigan but not in these concentrations. These organisms are especially abundant in the warm water discharge from the Bailly Station.

Blue-green algae (Cyanophyta) are also abundant in the warm water. The major species in this population is Gomphosphaeria lacustris.

Other golden-brown algae and green algae are present in smaller concentrations. Dinobryon sp. is commonly found [redacted]

but is found in highest volumes in Burns Ditch. With

that water and related materials from Burns Ditch are drifting eastward into the vicinity of Bailly Station discharge plume.

are found in the lake in normal and unpolluted situations. Cladophora glomerata and Lyngbya dignetti, the first and second most common forms encountered near the Bailly Station. Although Cladophora is normally observed in shoreline habitats of Lake Michigan, it should be noted that its growth is responsive to temperature and nutrient concentration. Under conditions of accelerated growth this species has become a nuisance since it can slough off of its substrate, wash ashore, and decompose, producing foul odors. The attached algae harbors several

3.5 SOCIOECONOMIC RESOURCES

3.5.1 POPULATION

Northern Indian property. Portage is the largest city in the 5-mile vicinity, with a population in 1980 of 27,409.

TABLE 3.5-1

PURE AIR, NORTHERN INDIANA

[redacted]

POPULATION DATA FOR INCORPORATED COMMUNITIES

[redacted]

Community	Miles/Direction From Site	Census 1970	Census 1980	% Change
Dune Acres	2.0 ENE	301	291	-3.3

[redacted]

Sources: U.S. Department of Commerce, Bureau of the

[redacted]

Northwestern Indiana Regional Planning Commission. 1987. County Profile: Porter County.

[redacted]

Station vicinity.

[redacted]

3.5.2.1 Regional

The Bethlehem Steel Corporation, Burns Harbor complex borders the site on the west and south perimeter. The

[redacted]

Within 2 miles of the Bailly Station there is very little permanent residential population because of the wide use of the land for purposes other than housing. A windshield survey of the Lakeshore area (January 1989) revealed a moderate amount of residential construction underway.

[redacted]

Station, however, almost no new homes or condominia were observed under construction.

[redacted]

3.5.2.2 Industrial

[redacted]

equipment, a coal storage area and associated facilities, [redacted]

which serves as a buffer between the Station and the National Lakeshore.

The area around the site, and in particular the area to [redacted] Chicago, all of which are centers of heavy industry, particularly the steel manufacturing industry. Besides the steel industry, construction companies and firms producing fabricated metal products as well as petroleum [redacted]

3.5.2.3 Agricultural

Very little of the land north of U.S. Route 12 is either suitable or used for agriculture. To the south of the Indiana Toll Road, the land in Porter, Lake and LaPorte

TABLE 3.5-2

PURE AIR, NORTHERN INDIANA
BAILLY GENERATING STATION ADVANCED FLUE GAS

MAJOR MANUFACTURING ACTIVITY WITHIN A 5-MILE RADIUS OF THE BAILLY GENERATING STATION [a]

City	Miles/Direction From Site	Industry	Product	No. of Employees
Chesterton	1/SE	Bethlehem Steel (Burns Harbor)	Steel mill	6,200
Chesterton	4.5/SE	Luria Brothers	Scrap metal processing	122
Chesterton	4.5/SE	Manley Brothers	Stone, clay, glass products	125
Portage	4.5/SSW	Bethlehem Steel	Steel mill	6,000
Portage	4.5/SSW	The Levy Co.	Stone, clay, glass products	300
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Portage	4.5/SSW	National Steel	Steel Mill	1,700

Footnote: [a] - Major manufacturers include those industries with 100 or more employees.

3.5.3 PUBLIC SERVICES

3.5.3.1 Schools, Hospitals and Nursing Homes

Table 3.5-3 lists the six hospitals within a 12-mile

special education, elementary, junior high, and high schools are covered by these data. Day care centers and pre-school facilities are not required to be monitored by the Indiana Department of Education, so no enrollment or location information is available.

Table 3.5-5 indicates the nursing homes and number of beds in the station area.

The Bailly Station is located in an area where access to transportation facilities is readily available. The two-lane U.S. Route 12 borders the Station boundary on the south as does the Chicago South Shore & South Bend Railroad (CSS&SB). A six-lane segment of an interstate highway, I-94, is located about 4 miles south of the

Station is located on the edge of Lake Michigan, it is possible to reach it by way of the lake. Figure 3.5-1

station. Northern Indiana has a relatively high density

TABLE 3.5-3

PURE AIR, NORTHERN INDIANA
BAILLY GENERATING STATION ADVANCED FLUE GAS
DESULFURIZATION PROJECT

[redacted]

Hospital	Location	No. of Beds
[redacted]	[redacted]	[redacted]
St. Mary Medical Center	Hobart	300
[redacted]	[redacted]	[redacted]
St. Anthony	Michigan City	190
[redacted]	[redacted]	[redacted]

[redacted]

[redacted] Section with Edward Kowalsky, Environtran, West Orange, NJ.

TABLE 3.5-4

PURE AIR, NORTHERN INDIANA
BAILLY GENERATING STATION ADVANCED FLUE GAS
DESULFURIZATION PROJECT

PUBLIC SCHOOL ENROLLMENT FOR COMMUNITIES WITHIN A 12-MILE
RADIUS OF THE BAILLY GENERATING STATION

Community	No. of Schools	1988 Pupil Enrollment
[redacted]	[redacted]	[redacted]
Porter	1	353
Portage	9	8,059
Hebron	3	1,425
Valparaiso	19	8,737

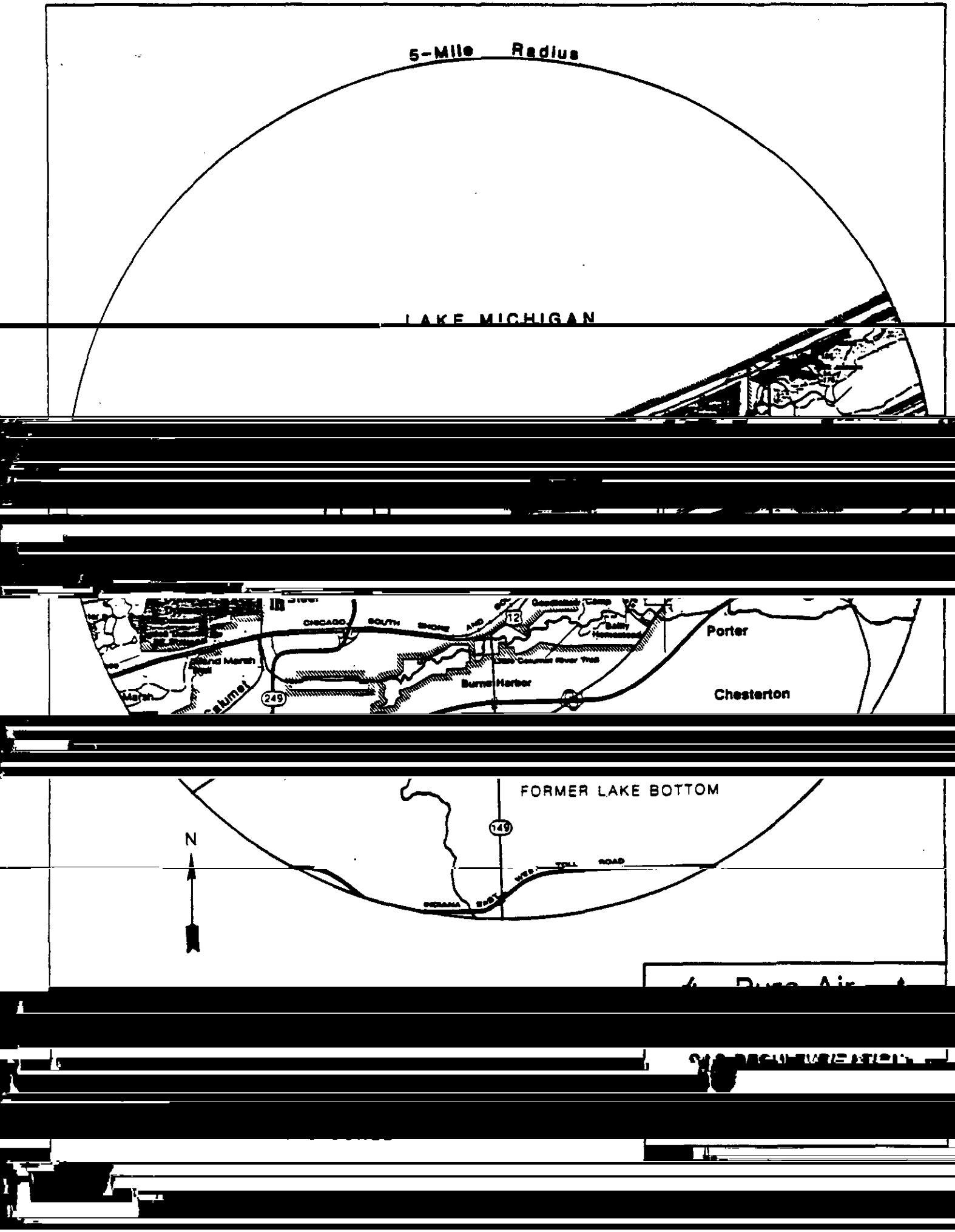
[redacted]

TABLE 3.5-5

PURE AIR, NORTHERN INDIANA
BAILLY GENERATING STATION ADVANCED FLUE GAS
DESULFURIZATION PROJECT

NURSING HOMES AND BED TOTALS WITHIN A 12-MILE
RADIUS OF THE BAILLY GENERATING STATION

Community	No. of Nursing Homes	Total Beds
Chesterton	[redacted]	100
[redacted]		
[redacted]		


5-Mile Radius
LAKE MICHIGAN
CHICAGO SOUTH SHORE AND
Porter
Chesterton
Burns Harbor
Calumet
249
12
149
FORMER LAKE BOTTOM
N
TOLL ROAD

in 1988 include Conrail and CSX. Direct commuter passenger service to the station entrance is available via

Several principal highways pass within 10 miles of the Station, including Interstate Highways 80, 90 and 94, 20, 12 and 6, all of which run north-south through Gary. U.S.

directly to U.S. Route 12. At present U.S. Route 12

(NPS) is in progress to determine the feasibility of

truck traffic along the highway by the Bailly-Bethlehem Steel sites. Results of the study are expected sometime in 1991.

there are no state-supported historical sites in Porter County. On the federal level, the Joseph Bailly Homestead and Cemetery are located within 2 miles of the Bailly Generating Station. The Bailly Homestead is listed in the National Register of Historic Places.

The South Shore Station at Beverly Shores has been nominated to the National Register of Historic Places as the only surviving example of stations from the early period of South Shore history. Northern Indiana owns the property on which the South Shore Station sits; it is

approximately 10 miles from the Bailly Station. The National Park Service has approved the application; the state is currently reviewing it and if the site passes state criteria, it will be submitted to and reviewed by the National Register of Historic Places.

There are no known significant deposits or archaeological materials within the Bailly Station property, although a few miles of the site. Cowles Bog, the closest, lies immediately to the east of the Station boundary. Dunes Nature Preserve is located within the Indiana Dunes State Park between the towns of Dune Acres and Beverly Shores. Pinhook Bog is situated about 12 miles east of the Station.

3.5.3.4 Recreation

Except for the 2 miles of industrial lakeshore occupied by [illegible] Port of Indiana, most of the 15 miles of lakeshore in [illegible] water is generally shallow within 50 ft of the shore line that line the shore of Burns Ditch and the public harbor at Michigan City.

[illegible] lakeshore, bogs and marshes. Public Law 89-761, passed [illegible] sufficient lands had been acquired to be administered

effectively as a unit. The Lakeshore was formally established in 1972 and is now administered by the National Park Service.

Fishing in Lake Michigan is a popular recreational pastime. Anglers fish from boats anchored near the end of the Bailly Station circulating water discharge plume where salmon, trout and perch are frequently in abundance. The

prevent anglers from continuing to use this excellent fishing spot.

Inland fishing is very limited. The inland lakes are not stocked by the Department of Natural Resources so local

Valparaiso area.

Northern Indiana currently operates two electric generating units at the

the site whereas the natural gas is delivered by an underground pipeline

at an average of 221 million gallons per day (MGD).

Every 2 to 3 years the Station must dredge the area surrounding the

at area beaches.

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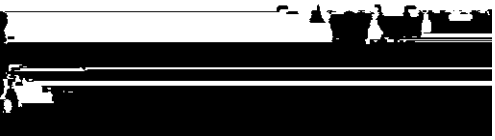

Indiana

Maps: C

Communit

Harbor,

0001B ar

Program 81-01. National Park Service, Midwest Region.

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SECTION 4.0

[redacted]

impacts during construction and operation of the ArGD system as discussed in

[redacted]

4.1 ATMOSPHERIC RESOURCES IMPACTS

4.1.1 Construction

[redacted]

and fugitive emissions or dust. However, they are expected to be temporary and localized. In addition, project specifications indicate that water will be sprayed on roads to reduce fugitive

[redacted]

4.1.2 Operation

During operation of the AFGD system, both overall emissions and ground-level concentrations of SO_2 will be reduced. When the

and will be within existing Bailly Station emission permit requirements as discussed below. Thus, no additional impact to

classified as an attainment area with respect to SO_2. During operation total NO_x emissions will remain unchanged, although concentrations of NO_x at ground level may increase as a result

SO_2, NO_x and PM_{10} even with conservative emission rate estimates and without subtracting the contributions of the existing stack from the background concentrations.

Operation of the AFGD system may slightly increase fugitive emissions in the area. This would be due to material handling

However, the small increase in fugitive emissions should not cause any discomfort to visitors to the National Lakeshore or to

shown in Table 4.1-1. As can be seen from this table, the IDEM,

in Section 6.2 Compliance Monitoring (Class II Monitoring).

TA 4.1-1

RE AIR, HERN NDIANA

ERATING ION A VANCED F
DESULFUR ION P OJECT

BAILLY STATION YSTEM I OAM I RMIT LIM A IONS

Parameter	Existing Station	Permits	Proposed System	Permit Limits
SO_2 (lb/)				1.2
NO_x (lb/)		E		NONE
Particul atter		2		0.22
(lb/M				
Opacity	Avera		Av -	40

The AFGD system will reduce the SO_2 emission rate by 90

Source Performance Standard (NSPS) and AFGD system permit level of

0.10 lb/MMbtu, respectively. The wet limestone slurry does not react with the NO_x so no NO_x is removed in the SO_2 absorber.

No additional particulate matter is expected to be emitted as a

The AFGD system opacity levels are expected to be slightly higher than existing levels, in particular during cold weather. The

moisture content of the stack plume. However, the expected permit limit of 40 percent opacity will not be exceeded

The AFGD system will be available to process all of the flue gas from the Bailly Station on a continuous basis. This will be accomplished by continuing to pass the Station's flue gas through

the AFGD system or during start-up or shutdown of the AFGD system, the Station's flue gas will flow through the electrostatic precipitators and the existing stack.

4.2 LAND RESOURCES IMPACTS

Land resources or use impacts during the 24-month construction period are projected to be minimal, primarily as a result of the

industrial state.

appropriately-approved landfill.

recreational land area adjacent to the Bailly Station. The National Lakeshore will be shielded from construction activities by the "green belt." The green belt is a 300-foot "L" shaped

owned by Northern Indiana, has been left in its natural state to serve as a buffer zone. The Bethlehem Steel Plant to the south and west should also be unaffected by construction because of its industrial environment.

There will be no impact of construction activity on historic

construction site, proposed for inclusion in the National Register of Historic Places, will not be impacted by construction activity.

4.2.2 Operation

operations will be minimal since operations will be taking place on a heavily industrialized site.

manufacturers of wallboard to allow Northern Indiana to become a

Alternatively, the gypsum could be landfilled at an existing permitted disposal site. Although this latter disposal option would consume less than 4 acres of land annually, assuming disposal of 220,000 tons in 20-foot lifts, use of an existing appropriately-permitted landfill would result in minimal

County that are appropriately permitted and that have their own approved environmental monitoring programs that they are responsible for.

The quantity of fly ash generated at the Bailly Station with the

existing operations as a result of the WES in the Unit 8 ductwork. If beneficial uses for the fly ash are not determined, it will be landfilled in an appropriately-approved facility. This

waste disposal and would have been used for normal Station ash

4.3 WATER RESOURCES IMPACTS

4.3.1 Groundwater

4.3.1.1 Construction

The construction of the AFGD system at the Bailly Generating Station will not have any effect on the groundwater in the area. There will be no major activities during the construction period that are expected to cause any problem with groundwater.

Any construction-related oil spills will be quickly contained by soaking into the soil's surface dressing. If necessary, the affected surface dressing will be removed from the site for disposal in an appropriately

4.3.1.2 Operation

The AFGD system will be designed to minimize waste water generation. However, there will be wastewater from the

discharged to the wastewater system at the Bailly Station per modification of the Station's NPDES permit.

Solid wastes (e.g., ash and potentially gypsum) generated from operation of the AFGD system may be put to

[redacted]

will be stored in silos prior to use in the AFGD system, and fly ash will be stored in a silo prior to removal from the Bailly Station. Thus, the impact on groundwater should be minimal.

4.3.2 Surface Water

4.3.2.1 Construction

[redacted]

4.3.2.2 Operation

Lake Michigan will provide all process water and meet

[redacted]

with other withdrawals from Lake Michigan, such as the

designed to comply with NPDES permit conditions according to IDEM, OWM. The relevant existing and new discharges in Table 4.3-1.

The Bailly Station currently has discharge through two outfalls to Lake Michigan and several internal outfalls as follows and shown on Figure 4.3-1

- Outfalls 001 and 002 are to Lake Michigan and consist of the total plant discharge, which is mostly once through condenser cooling water discharged at Outfall 001. Outfall 002 is an intermittent discharge in

cooling water, but generally is not needed.

in-plant causing the discharge to be intermittent. Outfall 301 (boiler blowdown) also contibutes to the main Outfall 001.

thence the ash ponds. Other waste streams contributing to the ash ponds are the discharge from

recovery, air heater wash, and precipitation on the surfaces of the ponds.

TAB 4.3-1

P AIR, THERN I ANA

E CN ING S ON ADV ED FLU
ULFURI ION PR CT

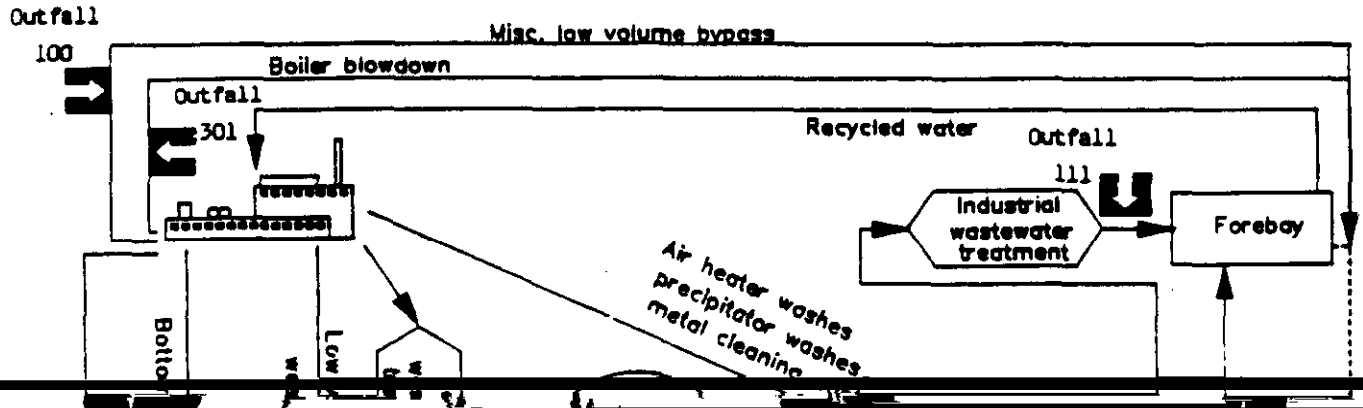
BA ATI PERMI MITS A WASTEW SC
AND S G STEM (INED O HARGES RM TS

R er		ion ng (mg	Per limits /l)	Combin Wit Propos	f ed ha	Station Disc arge ystem Wastew ter Permit Limits (mg/l
O	001 (Main Ou					
F	D)	(4	Rep	221.1	)	Report
T		6.2	N	<30		30 (100
O	Grease	Da	N	<15		15 (20
O		0.6	N	29.0	b	30 (40
T		Da	N	241.8	)	394 (400
S		3.6	N	24.6		52 (100
F		Da	N	0.4		1.4 (2 0)
O	201 (Sewage	ent				
F	D)	8 (	Rep	0.00	6)	Report
B		24	30)	2		30 (45)
F	liform					
	/100ml)	9 (	- 0)	11		- (400
T	sidual					
	ne	5 (	- 0)	0.4	)	- (2.0

F s: a Avera ma n ration re sho if kno n f imum indicat d
in pa ses

b Where onc n the av ge con ion fr t ly Station a d
the A ste a than t maximu or bot iti to a lower
flow, ign n ion is sted f the ma

c TNTC tes e to co .



Pure Air
a joint venture company
ADVANCED FLUE GAS DESULFURIZATION

BAILLY STATION/AFGD SYSTEM
WASTEWATER FLOWS

Figure 4.3-1 1/91

° Outfall 100 is an emergency bypass of the ash ponds of certain low volume wastestreams (floor drains, filter

° Sanitary wastewater (201) is treated by an actived sludge plant with chemical coagulation capability, sand filtration, and effluent chlorination. Coal pile run off (Outfall 003) is allowed to discharge to the

The AFGD system will have domestic sewage wastes and

will be routed through the Bailly Station's existing

system prior to combining with the Station's recirculating water. Thus, the AFGD system will impact

As can be seen from Table 4.3-1, for the parameters which

concentrations still will be within IDEM, OWM permit limits. In addition, additional monitoring requirements

at the main outfall (001). IDEM, OWM permit requirements

4.4 ECOLOGICAL RESOURCES IMPACTS

4.4.1 Construction

Construction activity related to development of the AFGD system is

systems. The area proposed for construction is presently free of

wildlife will result from increased human activities. This impact may be observed on the less mobile species such as amphibians, reptiles and small rodents, and to a lesser degree on avian

erosion and sedimentation control methods.

4.4.2 Operation

operation.

No state or federally listed threatened or endangered plant or animal species, or critical habitat for such species, are present on the Bailly Station. Also, based on the DOE consultation with

expected to be negatively impacted by the proposed project within the site area.

The AFGD system will conform to the requirements of the NPDES

aquatic resources are expected.

4.5 SOCIOECONOMIC RESOURCES IMPACTS

4.5.1 Construction

consist of up to approximately 400 construction employees at the

Experience from previous projects indicates that most of the workers will commute to the job site. This suggests that a number of workers may come from within Porter County and adjacent counties. A permanent work force up to 30 to 35 full-time employees will be required once the AFGD system is operational. This will contribute to an improved employment outlook in Porter County.

relatively small percentage of employees requiring permanent

4.5.1.1 Transportation

Primary access to the proposed construction site will be from U.S. Route 12 and the nearby interstate highway system. The anticipated increase in traffic volumes averaging from 100 to 200 vehicle trips per day will easily be accommodated by the existing transportation network. Vehicles associated with construction of the AFGD system will be requested to enter the Bailly Station property from the west on U.S. Route 12 in order to avoid

facilities. This will further minimize impact. The lack of residential and commercial enterprise in the area will

result of construction activities.

4.5.1.2 Noise

sound

result in Noise

site, where the majority of construction activity will occur, is such that the closest residence is approximately 8,400 ft (1.6 miles) away. At this distance, there will be a significant attenuation in the levels of construction noise at the nearest residential

4.5.1.3 Visual

4.5.2 Operation

The impact on population, employment and housing as a result of operation of the AFGD system will be positive for Porter County and the region surrounding the Bailly Station. Permanent employees of Pure Air will require housing, but will not place a large demand on the real estate market.

4.5.2.1 Transportation

The addition of from 110 to 120 vehicle-trips on a 24-hour basis will not impact the existing vehicular

will be easily accommodated on-site on a permanent basis.

place 06Ti 0 Tsensitive0828 0 TD 3 T2100 0506 Tc -0.8 Tww

4.5.2.2 Noise

Because of the industrial nature of the Bailly Station

net increase in area noise will be imperceptible. The results of an area sound level survey conducted in

Station area vary from approximately 47 to 63 dBA, depending on location. Sound levels in the area as a result of AFGD system operation are expected to increase less than 1 dBA. As indicated, this level is considered

4.5.2.3 Visual

AFGD system will be perceived as visually blending with the other structures on-site at the Bailly Station. The only exception may be the new stack that will be required for operation of the system. The new stack height will be approximately 480 feet or less to ensure a successful and environmentally sound operation. Operation of the

4.6 ENERGY AND MATERIALS RESOURCES IMPACTS

4.6.1 Construction

During the construction phase of the AFGD system heavy construction equipment as well as construction materials such as steel, cement

be other AFGD

and gypsum will be the by-product from the AFGD system. The raw materials to be consumed and gypsum produced for this project have been estimated as follows:

Estimated Annual Consumption

Coal 1,300,000 tons/yr

Estimated Annual Production

Gypsum 220,000 tons/yr

[redacted]

Estimated Average Consumption

[redacted]

Electrical usage 8.25 MW

Projected Emergency Consumption

[redacted]

The average and emergency water and electricity consumption estimates are based on the AFGD system design coal with a 4.5l

[redacted]

Limestone will be used as an absorbent. It is inexpensive and

[redacted]

Hydrated lime will be used intermittently in the AFGD system to

[redacted]

occur infrequently system tests are scheduled at once every two months. Tw (to)

[redacted]

Hydrated lime is readily available throughout the United States

[redacted]

SECTION 5.0

PROJECT MITIGATION MEASURES

The description of mitigation measures presented below is based on information presented in the EIV and the EA, and reflects current design.

Because the AFGD system will be installed in a heavily industrialized area, no significant Environmental, Health, Safety and Socioeconomic (EHSS) impacts are

program will create permanent employment and produce a potentially saleable

technology applicable at other locations throughout the United States.

no open burning.

The AFGD system will reduce SO_2 emissions to the environment during

during an upset condition, stack emissions will be redirected to the

The AFGD system's limestone and hydrated lime reagents will be stored in silos with bin vent filters to minimize fugitive emissions. In

silo prior to removal from the site.

Bulk loading of limestone, hydrated lime and by-product gypsum will be done with enclosed transfer systems, minimizing fugitive emissions from these activities. Trucks transporting limestone, hydrated lime or

on-site emissions to the atmosphere. Fugitive emissions resulting from

5.2 LAND RESOURCES MITIGATION MEASURES

During construction, the primary impact on land use in the immediate area may result from the occasional increase in sound levels resulting

The site is sufficient to absorb parking for the work force in existing and planned permanent parking areas. During operation the increase in

Disposal of ash and other solid wastes will be in appropriately

Finally, compliance with zoning requirements and the remote location of the AFGD system within a highly industrialized area will mitigate any

stormwater collection system, construction areas will be closed and

Small quantities of office waste materials, resulting from normal operations, will be stored in covered containers or trash bins to minimize potential contamination of surface water. These materials will

The ash generated from the AFGD system will be placed in an existing storage silo prior to removal from the site for disposal. Any material

Limestone, hydrated lime and gypsum also will be stored in either silos or a building (hydrated lime and gypsum) to prevent run-off to the surrounding area. Any material spilled around these structures will be

5.5 SOCIOECONOMIC RESOURCES MITIGATION MEASURES

No mitigation measures are proposed for socioeconomic impacts, since no significant impacts are projected during construction and operation of the AFGD system. The AFGD system is viewed as a benefit to the area's socioeconomic setting.

The generation of electrical power is by nature consumptive of natural

the SO_2 in the stack gas will be converted to a saleable by-product.

present levels.

SECTION 6.0

ENVIRONMENTAL MONITORING

The environmental monitoring program for the AFGD system addresses the three classes of monitoring during preconstruction, construction, and operation/demonstration phases of the project. These monitoring activities

The three classes of environmental monitoring are as follows:

1. Class I Monitoring, Environmental Baseline or Characterization Monitoring

will include measurements of feedstocks (coal, limestone, hydrated lime), operating conditions, information on discharges (air emissions, wastewater, solid waste), ambient environmental

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nmental dia	atior	Param		Frequency
olid	r APC	00 Test	O_3, CO_3, is-% (Mc Carbon, is-% (S, as rece l/Metals	imat e, V Ult , N, Btu dioa	iles, ce dry), ity[C]	1 - During AP and 1 - Dur System Oper Similar Coa APC-200 Tes	st th or
olid	uring n Per d	O_3				1 - Each Coal Different S Content Dur System Oper	
mestone	ed fc	O_3, CO_3, istribut ctivity		icle Gene	/Metals,	1 - During AP and 1 - Dur System Oper Similar Lim for APC-200	st th sed
drated Lime	e Sil	O_3, CO_3, ctivity		ral/	als,	1 - During AP Operation	m

[redacted] AB [redacted] -1

A [redacted] THE [redacted] N
[redacted] LY [redacted] TI [redacted] TIO [redacted] EI [redacted] GAS
UL [redacted] TIO [redacted] T

[redacted] IF [redacted] L [redacted] TER [redacted] M [redacted] ING
LA [redacted] MONI

E [redacted] ironmen Media	[redacted]	[redacted] amet	[redacted]	[redacted] c
G [redacted] sum	[redacted]	e [redacted] als 0 [redacted] $_2$0, 0 [redacted] (c [redacted] a d [redacted] , F i [redacted] ity, [redacted] v i [redacted] y, [redacted] t [redacted] icity r [redacted] tic [redacted] g [redacted] dure L [redacted] d, [redacted] N c [redacted] etho [redacted] Water u [redacted] lts, [redacted] r [redacted] Size	[redacted]	i [redacted] -20 [redacted] Test [redacted] ng [redacted] FGD m [redacted] tio [redacted] with a [redacted] Us [redacted] d for O
G [redacted] sum	[redacted] o [redacted] in	0 [redacted] , Ca [redacted] 2 , [redacted] de a	[redacted]	i [redacted] D S [redacted] stem t [redacted] th [redacted] ach r [redacted] lfu n
G [redacted] sum	[redacted]	0 [redacted] , Ca [redacted] 2 , [redacted] de a	[redacted]	i [redacted] D S [redacted] stem t [redacted] th [redacted] ach r [redacted] lfu n
A [redacted]	[redacted] O [redacted] st	e [redacted] als [redacted] c [redacted] , r [redacted] , I [redacted] i c [redacted] TC [redacted] a t [redacted] chi [redacted] d	[redacted]	i [redacted] -20 [redacted] Test

T[illegible]LE 6.0-[illegible]TD)

[illegible]URE [illegible]R, NORT[illegible] [illegible]NDI[illegible]
[illegible]IL [illegible]NERA[illegible] [illegible]NG STATI[illegible] [illegible]VANC[illegible] [illegible]E GAS
[illegible] DES[illegible] [illegible]FURIZATI[illegible] [illegible]OJEC[illegible]

[illegible]NV [illegible]ENTA[illegible] [illegible]CHARACTI[illegible] [illegible]ION [illegible]RING
[illegible] (C[illegible] [illegible]ASS I MO[illegible] [illegible]NG)

Environme Medi									
					ters			que	
Ash		wi		General Ignitab Test, I Method $CaCl_2$, $CaSO_4 \cdot 2$	s, (Re Ne Rad	ivity, ty, TCLP Leaching vity, 2, aF_2		Du per imi PC-	AFGD System n with Coal Used for Test
Ash		wi		General Ignitab Test, I Method $CaCl_2$, $CaSO_4 \cdot 2$	s, (Re Ne Rad	ivity, ty, TCLP Leaching vity, 2, aF_2		Du per imi or	AFGD System n with Coal Used 200 Test
Ash		wi		$CaSO_4 \cdot 2$ Sulfide	O_4			Du per iff ont	AFGD System n with Each t Sulfur Coal
Ash		wi		$CaSO_4 \cdot 2$ Sulfide	O_4			Du ach ont	Testing with ferent Sulfur Coal

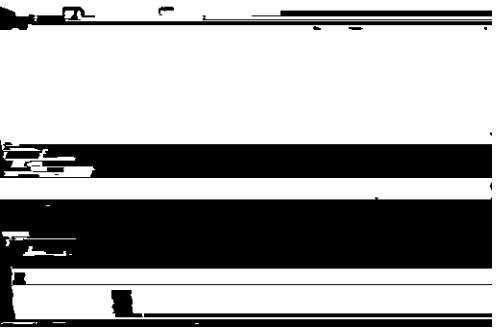

TABLE 6.0-1 (CONTINUED)

BAILLY GENERATING STATION NORTHERN INDIANA PUBLIC SERVICE COMPANY
FLUE GAS DESULFURIZATION PROJECT

ENVIRONMENTAL CHARACTERIZATION MONITORING
(CLASS I MONITORING)

Environmental Media	Sampling Location	Parameters	Frequency
Wastewater	AFGD System Wastewater Treatment Facility Influent	Sulfate	During AFGD System Operation with Each Different Sulfur Content Coal
Wastewater	AFGD System Wastewater Treatment Facility Effluent	General/Metals, pH, Flow, TSS, Oil and Grease, TDS	During AFGD System Operation With Milestone Coal Used for APC-200 Test
Wastewater	AFGD System Wastewater Treatment Facility Effluent	Sulfate	During AFGD System Operation With Each Different Sulfur Content Coal
Air			
Air Emissions	Bailly Station Stack	SO_2, Opacity, Particulate Matter	Analysis, Continuous in 1992 and
Air Emissions	AFGD System Stack With WESP Operation	Other Metals, Hydrocarbons, Particle Size Distribution, Particulate Matter, NO_x, SO_3/	During AFGD System Operation with Final Coal Used for APC-200 Test

TAB 5.0-1

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nen ia	a	g Loc		P	rs	quenc	
ssi	F	stem ation	it S	Meta rticle rticul /H_2SO	urr ist ter	roc ns, on,	Dur pera oal l est	S stem h imilar A C-200
ssi	F	stem Oper	it	, SO_3			Dur pera iffe oal	S stem h ach fu Content
ss	F	stem atio	it S	, SO_3			Dur pera iffe Conte	S stem h ach fu
ss as	e e p	AFGD with on	Al er i	Meta rticle rticul /H_2SO	our Dis tte	roc ns, on,	Dur pera Coal Test	S stem h imilar C-200
ss as	e e	AFGD with	Al er Op ion	Meta rticle rticul /H_2SO	our Dis tte	roc ns, on,	Dur pera Coal Test	S stem h imilar C-200
ss as	e	AFGD r Ve Oper	h	2, SO_3			Dur pera iffe Coal	S stem h ach f Content

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Environmer Media	Sampling Lo					
Air Emissi (Flue Gas)	Before AFGD Absorber Ve VES *in Oper*					AFGD System with Each Sulfur Content
Sound	ocations o roperty an rea (incl akeshore)	Station ding onal		m		Depending on ing Daytime and
Footnotes:	e APC-200 roshima, J illy Gener March, 19	pilot pl e test was tion AFGD		Resear e gas limes		ent Center in ons for the was conducted
	neral/Meta , Pb, Li,	s of the , Mo, Ni,		Be, C S, S		Co, Cu, Cn, F, Zn.
	dioactivity don-222, ar	consists -230.		-210,		adium-226,
	P Test ana	lude As,				

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Footnotes: e- Indi tra n d s th TCLP Te u he add ion of acetic aci
(Contd) incl e a f fo g: , B, Cl , Fe, M Ni, Phenols, Na,
Sulf S,

f- Wher onm a za onit ing is d thout with the WES, th
moni is n er of WES. e will p ceed with monitor
envi al t d he when t o s util ing the base or n
sulf ent d rs ere sulfur c for t parameters indic
Tabl . si ant fferenc e alytic results, the pro
prop mir le es pro ate env a edia e her without or wi
WES re s on coal Subsec i ing wi then be contingе
oper f s us lica .

g- Air co lo Sb s, Ba, C Cu, Pb Mn, Ni, Se, Ag, a

TAB .0-2
P IR, HERN
GE ING S ON AD FL GAS
FURI ON PR
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ironmental Media	Sampling Location	Param	Frequency[a]
id			
l Solid	Bunkered Coal	S, h, Bt y	Daily
sum	Gypsum Storage Are	o Be ermin on dered Was ateri M ener etals oa ivity[c], Includ orro ty, I li ,	To Be Determined By Regulatory Agency Requirements
		eact y, TC d, ndiana eutr eachi od est[e]	
	Ash Storage Silo	o Be ermine egu atory gency quiren anc Method o ispos But Ma ude ener etals, act vity, orros Igni y, Reactivi y, CLP T Indi utr l Leachi g ethoc t	To Be Determined By Regulatory Agency Requirements
ewater tment em Solids	AFGD System Wastew Treatment System	o Be rmine gu tory gency uirem d ethod of ispos But M ud ener tals, ct vity, orros y,Ign ty Reactiv y, CLP T Indi tr Leachi g ethod t	To Be Determined By Regulatory Agency Requirements

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Media			Parameters	Frequency
Liquid				
Wastewater	Daily	Flow, Temperature, Total Residual Chlorine, Chlorination, Sulfate, Fluoride, pH	Frequency of TDS,	From Weekly to Monthly
Wastewater	Daily	Flow, BOD_5, Residual Chlorine	Coliform, Total	From Two Times Weekly to Monthly
Wastewater	Daily	Flow, TSS, pH, Sulfate, Fluoride	Phosphorus, Chloride	From Two Times Weekly to Monthly
Wastewater	Daily	Flow, TSS, pH, Sulfate, Fluoride	Phosphorus, Chloride,	From Two Times Weekly to Monthly
Emissions	Daily	SO$_2$, Opacity, Particulate Matter	Coal Analysis,	Continuous in 1991 and 1992 and
Emissions	Daily	Opacity		Continuous

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Environmental Media	Location	ers	eque
Air Emissions	ation 7 and d Inlet FGD Syste	2,	inuo
Air Emissions	em Stack	2, rt er	inuo in d 94

Footnotes: a- The y of samp ill by litions Therefo he i ed
fre ould be c ed na ropria e permits issu

b- Ger ls consis he ng s, Ba, B, Be, Co Cl, ,
Cn, b, Li, Mg g, K , SO_4, ulfide a Sn, , V, nd
Zn.

c- Rac y analyse ist ss eta, l d-210, p um-2 iu 226,
rac nd thoriu

d- TCL alyses in As, C e, and g.

e- Inc ral Leach choc s t with t the ac n of a d
anc the anal or t ow Cl, C Cn, F, n, N ol Na,
SO_4 as S, TD and

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TABLE [illegible] O-3

PURE AIR, NOR[illegible]ERN IND[illegible]
BAI[illegible]LY GENERATING STA[illegible]N ADVA[illegible] FLUE GAS
DESULFURIZA[illegible]N PROJE[illegible]

[illegible]UPPLEMENTAL ENVIR[illegible]ENTAL M[illegible]ORING
(CLASS III [illegible]ITORIN[illegible]

Environmental Media	Sampling [illegible]tion	Parameter	Frequency[a]
Sound	Location Station Surround (includi Lakeshor	Bail[illegible]y [illegible]rty [illegible]nd [illegible]rea [illegible]tion[illegible]l	dBA, Leq, [illegible]tave B[illegible] [illegible]pectrum	1 - Before [illegible]nd 1 or 2 - After [illegible]GD System Sta[illegible]-up[a]

Footnote:[a]- Sound level [illegible]s w[illegible]ll be conducted be[illegible]re and [illegible]r AFGD system start-up. If the [illegible]ter start-up sur[illegible]; no[illegible] conducted during [illegible]time (F[illegible]or Winter) when vegetation and i[illegible]ect noise are le[illegible]ely to interfere with [illegible]und lev[illegible]easurements, a second after star[illegible]up survey will [illegible]duc[illegible]ed. This survey w[illegible]l be do[illegible]t the earliest possible date aft[illegible] start-up, at [illegible]e t[illegible]at is consistent w[illegible]h AFGD [illegible]em operations.

6-13

1/91

2. Class II Monitoring, Compliance Monitoring

Class II monitoring will be the monitoring that is required by

[redacted]

monitoring activities. Supplemental environmental monitoring

[redacted]

The aforementioned classes of environmental monitoring are based on the

[redacted]

Class II (supplemental monitoring). Class I monitoring in this scheme is the same as Class II monitoring (compliance monitoring) used in this EMP; whereas

[redacted]

monitoring) and Class III (supplemental monitoring) monitoring activities.

[redacted]

6.1.1 INTRODUCTION

[redacted]

This category of monitoring involves both environmental and

[redacted]

6.1.2 ENVIRONMENTAL STUDIES

The focus of the baseline environmental studies has been the EIV and EA. As part of the development of the EIV and EA for the AFGD project, existing environmental conditions were described for the several disciplines described in Section 3.0 Existing Environment.

Based on process and other information, predictions were made on the impact of the AFGD project on the area environment and appropriate mitigation measures were developed. The potential impacts and mitigation measures were described in Section 4.0 Consequences (Impacts) of the Project and Section 5.0 Project Mitigation Measures, respectively.

6.1.3 OPERATING PERFORMANCE TESTS

(Table 6.0-1). Phase Tests of will be conducted to identify limitations of the AFGD process and operating parameters that may affect

6.1.3.1 Bailly Station Operating Conditions

Several Bailly Station operating conditions will be examined based on existing information. These include primarily those associated with air emissions, wastewater discharges, solid waste disposal, and ESP performance. This information will be compared with information

operations.

system. Air emissions are currently monitored for SO_2, flow, temperature, total residual chlorine, and duration and frequency of chlorination; whereas, at the internal [redacted] monitoring is for flow, BOD_5, fecal coliform and total residual chlorine. Additional details are provided on the existing monitoring requirements for air emissions and wastewater discharges in Section 6.2 Compliance Monitoring (Class II Monitoring).

[redacted]

appropriate data is available during baseline monitoring, it will be incorporated in the monitoring program for [redacted]

6.1.3.2 Process Operating Conditions

Numerous AFGD operating conditions will be monitored. These will include solid or liquid samples, as appropriate, which will be analyzed for the parameters indicated in Table 6.0-1. The sample media will include

- raw coal;

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Parameter	Permit Limits	Monitor Frequer		Monit ethod/	ion	Expir	mit on Dat
(lb/MMBTU)	6.0	Daily	ge	unked oal, o as a	burned ural		1, 19 2
(lb/MMBTU)	None	None		one		N	
ticulate Matter /MMBTU)	0.22	Once ea during years 1992[c]	ar d	PA Met	, Stack		1, 19 2
city (%)	40 [b]	Continu	%	EM, St			1, 19 2

tnotes: a - amples are analyzed f t c sulfu ash an sture.

b - ary exemptions are al for g boi start nd
wns. During boiler s ps rom t 40% op limit is
d for up to 10 (ten) nut ods o ntil t ue gas
ature entering the el tat r rea es 250 es F, which
ccurs first. During sh mptio rom th opacity
is allowed for up to n) rage iods.

c - isting Bailly Station tio fies t for culate
monitoring, "The fir t s med d ng cal year 1990
nother test to be per du year 2."

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ON ADVANCED FLUE AS
ON PROJECT

ND MONITORING RE IREMENTS
O NPDES PERMIT M IFICATI a

		Measu ement Frec ency	Sample Type
l OC n O			
MGD		Daily	24-Hr Total
atu		Daily	Continuous
Res Chlo l/		During Dis arge of Chlorine B ring Wa water	Grab
on rin Hr		Monthly Re rt	Hrs
nat eque		Monthly Re rt	Frequency
l 20 age en			
MGD)		Weekly	24-Hr Total
mg/l		Weekly	8-Hr Composite
Coli per		Weekly	Grab
Resi hlo /l		2 x Weekly	Grab
tes: Th t	n	fect from Novemb 1, 198 ntil midnight March 31, 19	
N/ t	l i		

During the 3-year demonstration period, Indiana-Illinois

6.1.3.3 Environmental Emissions and Discharges

Sound levels, potential solid wastes, wastewater

parameters will include the following:

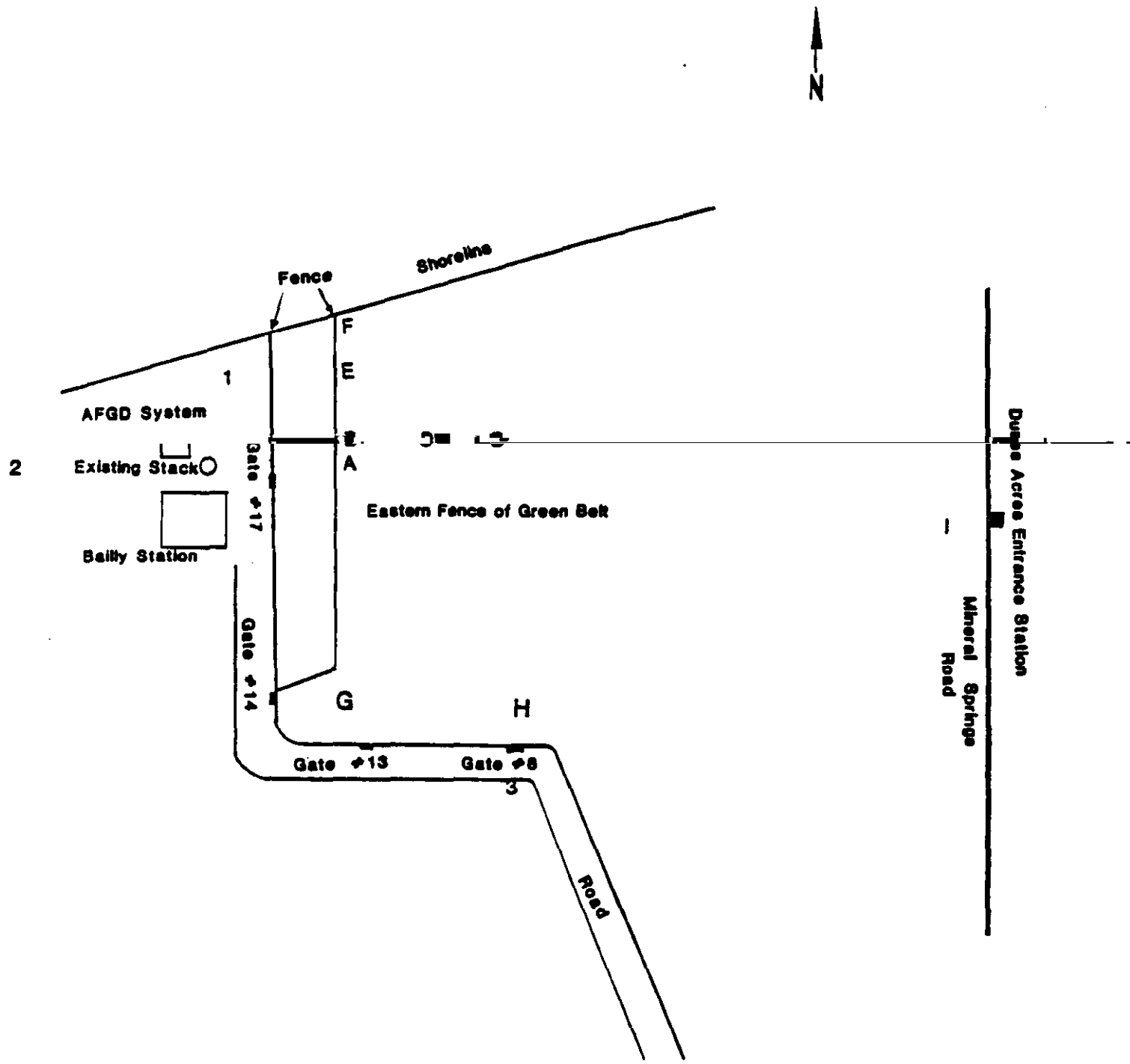
Sound Levels

° sound levels on Bailly Station property and surrounding area (this monitoring activity was described in Table 6.1-3 during February, April and October, 1989).

Solid Wastes

operation with similar coal used for APC-200 test and

° ash from APC-200 test, and during AFGD system



Notes:

1. Figure Not to Scale.

Homestead) Are Not Shown on the Figure.

Pure Air
ADVANCED FLUE GAS DESULFURIZATION
Locations
Figure 6.1-1 1/91

TABLE 6.1-3

RE AIR, NORTHERN INDIANA
RATING STATION ADVANCED F
ESULFURIZATION PROJECT

LEVEL MONITORING STATIONS

Monitoring Station	ion	Monitoring Period	enc	Parameters	
1	Stati n gr suppo on	102 ft e, 360 ft Unit rner.	April	me tir	eq[c], Octav eq, Octave
			October	me tir	eq, Octave eq, Octave
2	hleh	nt	April	me tir	eq, Octave eq, Octave
3	te # belt	m	April	me tir	eq, Octave eq, Octave
			October	me tir	HBA[e], Leq, BA, Leq, O
4	n Sta 2	.S.	February	tir	eq
			April	me tir	eq, Octave eq, Octave

[d] ectrum
ctrum

1-3 (CONT

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BA ENE ATION ADV UE GAS
D ATION PRO

ND NITORING S

tation	ation	i	itoring eriod	ring ncy[b]	r	rs
5	s t Stati	i aes	bruary	e	L	l
			ime	L		
			ril	e	L e	Spe m
			ime	L e		Spe m
A	fi existi ,		tober	e	dE e	Spe m
	f ern gr f			ime	dE e	Spe m
	el rest o n	re				
	lo down t a					
	50 ft fro r	in				
B	n of A, a	as	tober	e	L e	Spe m
	ell nce on d	ll		ime	L e	Spe m
	e					

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ER STA AM
DE IZA BE
L MONI T

Station	D iptio	Per nit	ng y[b]	Para
C	as n of hi	Octo		dBA, Octave trum
			ne	dBA, Octave trum
D	A O o on fla	Octo		Leq, Octave trum
	rn l facir on		ne	Leq, Octave trum
	ro o ll to			
E	A O acros	Octo		dBA, Octave trum
	ow o f hill		ne	dBA, Octave trum
	O o est of			
	s easte			
F	A t th of t	Octo		dBA, Octave trum
	e a e lt fer		ne	dBA, Octave trum
	a outh.			
	m t assy a			
	r al ichiga			

TABLE 6. (CONTI

PURE AIR, NO ERN IN
BA Y GENERATING ST N ADV E GAS
DESULFURIZ N PRO

SOUND LEVEL MON RING S

Station	escripti	Moni ing Pe d	ar ters
G	80 ft so e #14 al curving	Oct	dB ve nd Spectrum
	ence, th northeas area		dB ve nd Spectrum
	n south nslope s of small		
	ill. Cr l toward tation		
	bout 100 th		
H	cross fr about 4 from	Oct	dB ve nd Spectrum
	estern g ence		dB ve nd Spectrum
I	bout 100 rom the e Acres	Oct	Le ve nd Spectrum
	ntrance ineral S gs Road)		Le ve nd Spectrum
	n Cowles Trail in g flat		
	rea.		

BLE 6. CONT

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B GENE NG ST ADV D FLUE GAS
FURIZ PRO

UND EL MO NG S ONS[a]

Footnotes:

a - The sound mo ring s du 1989 were as
February ril to 18 ctob 9 to 31.

b - The monit fre cy va rom to two times f station
per monit per for b ytim d nighttime.

c - dBA measu s a secor erva or 20 minute p ere
used to c te valen d le or Leq.

d - Sound lev sur ts we e fo e octave band) with
center fr lies 31.5, 25, 500, 1,000, 2 000 and
8,000 Her).

e - For the i ed ions, owes weighted sound dBA)
measureme re rded a l ute period at nning
and end o de ated ng.

Wastewater Discharges

[redacted]

- Bailly Station Sewage Treatment Facility Discharge Outfall 002 prior to AFGD system start-up, and

- [redacted]

Air Emissions

- Bailly Station stack before AFGD system start-up;

- [redacted]

- Flue gas before AFGD system absorber vessel without [redacted]

- Flue gas before AFGD system absorber vessel with WES [redacted]

For both the monitoring of wastewater discharges and air emissions, the sampling methods and types will be the same as [redacted]

parameters selected for monitoring are based on the following:

1. Parameters which are not required to be monitored by regulatory agencies;

2. Parameters which have been analyzed in similar studies;

3. Parameters which are analyzed as part of the APC-200 test and

4. Parameters that could be affected in various environmental

6.1.4 SCHEDULE

6.1.4.1 Duration

Environmental characterization sampling will be initiated before start-up of the AFGD system and will continue for the 3-year demonstration period, depending on the environmental media to be sampled as follows:

° February, April and October, 1989: Sound Surveys on

° March, 1990 through January, 1991: APC-200 test and

° Spring, 1990 to Spring or Summer, 1992: Baily Station

Summer to Fall, 1992: Raw hydrated lime sampling, and

° Summer, 1992 (Startup) through 3-Year Demonstration

6.1.4.2 Frequency

Environmental characterization sampling will be conducted once during an APC-200 test before AFGD system start-up for coal, limestone, gypsum and ash. Similar sampling will occur for these media and hydrated lime, one time during AFGD system

analyzed once each for SO_3 and % S. Sound levels on Bailly Station property and the surrounding area will be determined

with and without the WES in operation, also when the system is

content coals are used, wastewater at various locations will be monitored once each for sulfate; air emissions at select

operation of the WES. It should be noted that the proposed

[redacted]

Compliance monitoring will consist of monitoring required by [redacted] monitoring required will be defined by the AFGD project's permits. Environmental permitting began with the initiation of the development of the EIV in the Fall, 1988. This was followed in the Spring, 1989 when work was begun on obtaining air emission and wastewater discharge permits. Environmental permitting [redacted] were obtained prior to the start of construction. Other environmental permitting activities which were not required prior [redacted] project, but may not be completed until the AFGD system is in operation. Environmental monitoring requirements based on contact [redacted] in Table 6.0-2.

6.2.2 PERMITS AND CONDITIONS

Currently it is expected that there will be three major permits for [redacted] conditions: (1) Permit for Construction of Air Pollution Control Facilities, (2) Permit for Operation of Air Pollution Control Facilities, [redacted] wastewater (domestic sewage and process wastewater). In addition, the Bailly Station's existing permit for Operation of Air [redacted] Station's stack will be used when the AFGD system is not in operation or during an upset condition. Copies of the existing

fo'sr

Permit for Operation of Air Pollution Control Facilities, the AFGD system's Permit for Construction of Air Pollution Control

[redacted]

the discharge of wastewater, are included in Appendix A. Details

[redacted]

solid waste disposal.

6.2.3 MONITORING REQUIREMENTS AND ENVIRONMENTAL MEDIA

[redacted]

6.2.3.1 Air Emissions

Compliance Monitoring for Air Emissions: Because operation of the AFGD system will involve air emissions

[redacted]

stacks as discussed below and shown in Tables 6.1-1 and

[redacted]

Station's flue gas will flow to the existing stack.

[redacted]

limits shown previously in Table 6.1-1. As can be seen from this table, the IDEM, OAM has placed limits on

[redacted]

TABL[illegible]1

PURE AIR, N[illegible]N I[illegible]ANA
B[illegible]LY GENERATING ST[illegible]ADV[illegible].ED FLU[illegible]
DESULFURIZ[illegible]PRO[illegible]:T

AFGD SYST[illegible]M, C[illegible]
PERMIT LIMITS F[illegible]STRU[illegible]ION OF
AIR POLLUTION [illegible]- FA[illegible].ITIES

[illegible]er	Permit Limits	[illegible]nitoring [illegible]equency	[illegible]agi[illegible] [illegible]oac[illegible]	[illegible]it[illegible] [illegible]d/[illegible]	Permit Expiration Date
[illegible]/M[illegible]TBU)	1.2	[illegible]ntinuous	ave[illegible]e and [illegible] ro[illegible]ng [illegible]ed [illegible]rage	[illegible]ev[illegible]	-[a]
[illegible]/M[illegible]BTU)	N/A [b,c]	[illegible]ntinuous	ave[illegible]e and [illegible] ro[illegible]ng [illegible]ed [illegible]rage	Co[illegible] [illegible]ct	-[a]
[illegible]/M[illegible]BTU)	None	[illegible]ne			None
[illegible]la[illegible]e Matter [illegible]STU	0.22	[illegible]ce within [illegible]0 days of [illegible]GD system [illegible]art-up and [illegible]ce during [illegible]94 [d]		[illegible]et [illegible] 17,	-[a]
[illegible] ([illegible]%)	40	[illegible]ntinuous	[illegible]rio[illegible] 40% on [illegible]nut[illegible] verage	Ur[illegible] ts[illegible] [illegible]Ps[illegible] mt[illegible] [illegible]am [illegible]ream	-[a]
[illegible] ([illegible]%)	N/A [b,e]	[illegible]ntinuous	ave[illegible]e and [illegible] ro[illegible]ng [illegible]ed [illegible]rage	Ne[illegible] [illegible]ne	-[a]

PUR NO RN INDIANA
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a - s wa tiv ril 4, 1990. mit revoked
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ana per testing withi ys e WES
Bot 7 8 shall be in on r
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permit limits for NO_x. SO_2 emissions are calculated from bunkered or as burned coal, or natural gas sulfur content. A stack test for particulate matter is required once every 2 years; whereas, opacity is monitored

operation of air pollution control facilities is in effect until July 1, 1992. Prior to this expiration date,

IDEM, OAM.

Station permit, IDEM, OAM has placed limits only on

Unit 7 and 8 ducts. In addition to these monitoring requirements and permit limits, the IDEM, OAM requires the following:

° Particulate matter emissions from each of the limestone and hydrated lime bin vent filters shall be limited to 0.02 grains per dry scfm.

roadway flushing program, and

maximum sulfur content of 0.3 percent.

Rationale for Air Emissions to be Monitored. The Bailly

emissions from the new stack, emergency diesel generator

and material handling. The rational for emissions monitoring requirements are discussed below.

The Bailly Station currently has air emissions monitoring

demonstration period, monitoring will continue for SO_2.

The AFGD system is not expected to change from current

more extensive monitoring requirements for these parameters.

The air emissions from the AFGD system's emergency diesel

emissions from materials handling are below the PSD

source.

6.2.3.2 Wastewater Discharges

with IDEM, OWM on how to approach permitting the AFGD

ABLE 6.2-2

. NORTHERN INDIA
STATION ADVANC
RIZATION PROJEC

TEM PERMIT LIMI
WASTEWATER DIS

Outfall/Parameter	Mon Ave	Daily Maximum	sur equ	
Outfall 001 (Main)				
Flow (MGD)	epo	eport	Dai	
Temperature (°F)	epo	eport	Dai	
Total Residual Chl Grab	mg/ /A	2	Dur sch Chl Bea stewater	
Duration of Chlori (Ho	/A	A	Mon epo	
Chlorination Frequ	/A	A	Mon epo	
pH [b]	6		2 x y	
Chloride [b]	30	0	2 x y	ite
Total Dissolved So	44	00	2 x y	ite
Sulfate [b]	2	00	2 x y	ite
Fluoride [b]	.4	.0	2 x y	ite

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TEM IMITS AND NG
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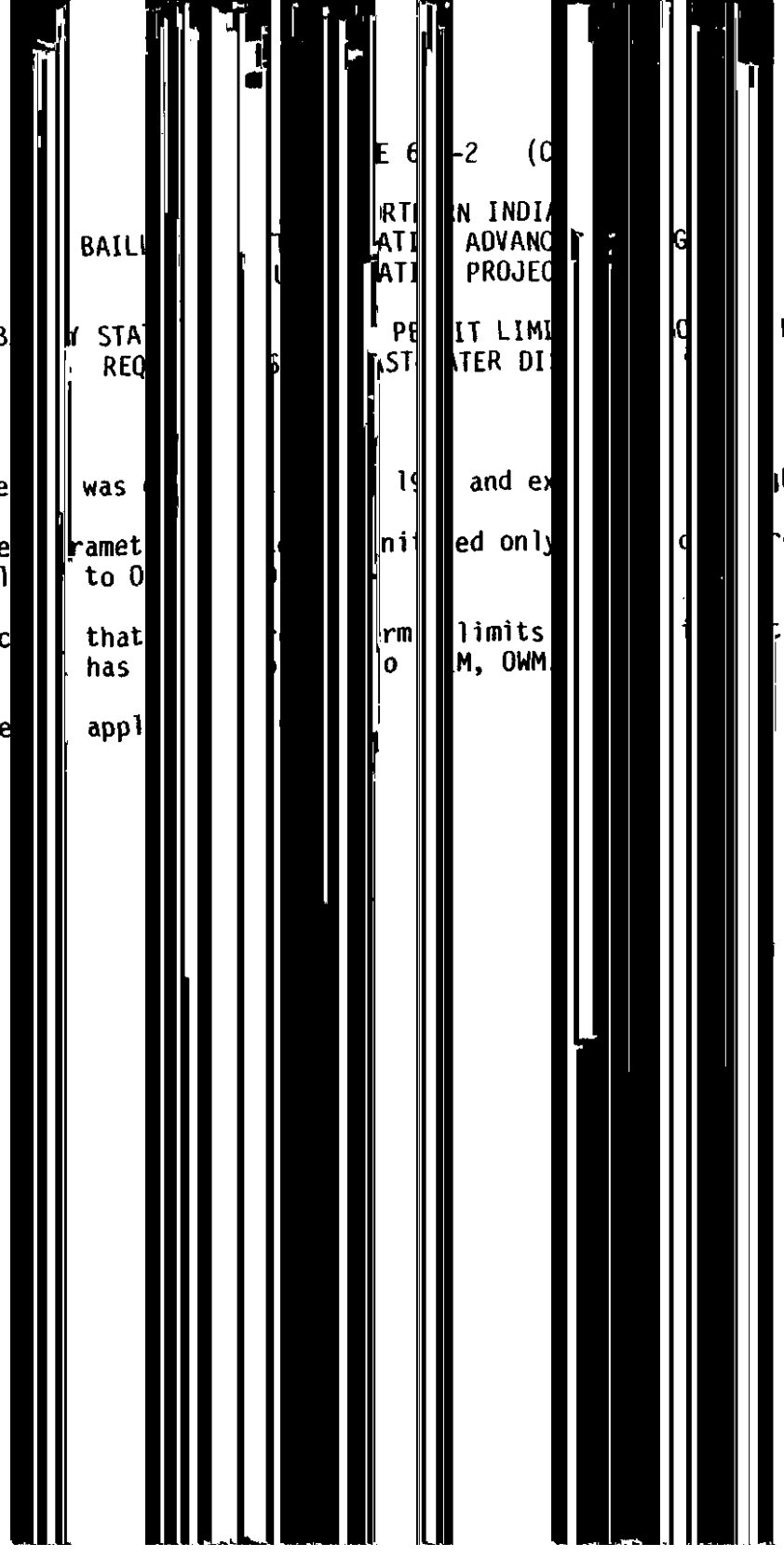
mg/			
Col Form (per 00 ml)			
Res dual Chlo ne (mg/			
4 (AFGD S tem Dis)			
MGD			
g/l			
G ease (mg/			
de ng/l)			
Dis olved Sol s (mg/l			
e (g/l)			
de ng/l)			



Footnotes: a - The NPDES pe was (l9 and ex ght August 31, 1993.

b - The indicate ramet ni ed only d rge of AFGD system process water from Outfall to O

c - Report indic that rm limits ced parameters and the information has o M, OWM

d - N/A indicate appl

[redacted]

At the internal Station Outfall 201 (sewage treatment plant), the IDEM, OWM will continue requiring monitoring [redacted] chlorine.

Because of the addition of an internal discharge from the [redacted] solids, sulfate, and fluoride.

Depending on the parameter, wastewater generally will be [redacted] chloride, total dissolved solids, sulfate and fluoride at Outfall 001, are applicable only during periods of discharge from Outfall 401.

Rationale for Wastewater Discharges to be Monitored:
Operation of the AFGD system at the Bailly Station will [redacted] sanitary sewer wastes that are similar to those to be [redacted]

Outfall 401, process water from the AFGD system, will be

predicted wastewater characterization of key parameters

discharge (outfall 001) to Lake Michigan based on the addition of the discharge from Outfall 401.

6.2.3.3 Solid Wastes

Compliance Monitoring for Solid Waste: Operation of the

three wastes: ash, gypsum, and wastewater treatment system solids.

result g

the Station does not analyze the ash.

If gypsum from the AFGD system is disposed in a landfill,

Similar requirements are expected for the wastewater treatment system solids.

Rationale for Solid Wastes Monitoring: As indicated above, the monitoring activities for solid waste were [redacted] necessary, in appropriately approved facilities which have their own approved environmental monitoring programs that they are responsible for.

6.2.4 SCHEDULE

6.2.4.1 Duration

Compliance monitoring will be initiated as part of start-up activities and will continue through the commercial operation of the AEGD system. However, only [redacted] 1995), will be provided to DOE per the Cooperative Agreement.

6.2.4.2. Frequency

The frequency of compliance monitoring for various parameters is based on the permit conditions for air emissions, wastewater discharges and solid wastes. The [redacted] and 6.2-2. The frequency for the general categories is summarized as follows:

- Wastewater Discharges: Daily, two times weekly,

- Solid Waste: To be determined by regulatory agency

materials are generated. There may not be any

6.3 SUPPLEMENTAL ENVIRONMENTAL IMPACT MONITORING (LACK OF MONITORING)

The necessity for supplemental environmental impact monitoring

determined

Environmental Assessment, and (2) evaluates the need to monitor

6.3.2 MONITORING PREDICTED IMPACTS

The area in which the Bailly Station is located is highly industrialized. Thus, impacts other than in the immediate

Therefore, the planned environmental characterization and

supplemental monitoring be addressed in more detail than shown in

6.3.4 SUPPLEMENTAL MONITORING MEDIA

The AFGD project will be constructed and operated in accordance with all applicable governmental rules and regulations. This will

and the utilization of good engineering practice to protect worker

environmental characterization monitoring activities. Therefore, it is believed that the compliance and environmental

after AFGD system start-up. All of the stations described in Table 6.1-3 and shown in Figure 6.1-1 will be monitored. At each of these stations, daytime and nighttime sound level measurements

taken at these two stations.

will be conducted before and after AFGD system start-up. If the after start-up survey is not conducted during a time (fall or winter) when vegetation and insect noise are less likely to interfere with sound level measurements, a second after start-up

consistent with AFGD system operations.

Following the supplemental sound level monitoring, the sound level data

attenuation features will be considered for the AFGD facility. The 5 dBA action level is based on a level which project team members believe, based on extensive sound level survy experience, can be accurately measured by a sound level meter.

begin with determining the best locations to obtain representative samples. Sample collection procedures will then be defined and

laboratory is involved, they will receive appropriate samples. The

Agency-EPA, certification), if appropriate, and a within laboratory quality assurance/quality control program. The laboratory will use EPA or IDEM approved analytical methods. Typical approved analytical methods for the majority of the parameters which are expected to be analyzed as

6.4.1 AIR EMISSIONS MONITORING QA/QC PROGRAM

The QA/QC program for the CEMs or collection of air emissions monitoring will include the following, which may vary depending on the gas or instrument being calibrated.

TABLE 6.2-3

PURE AIR, NORTHERN INDIANA
BAILLY GENERATING STATION ADVANCED FLUE GAS
DESULFURIZATION PROJECT

POTENTIAL CHEMICAL AND PHYSICAL
PARAMETERS TO BE ANALYZED AND ANALYTICAL TECHNIQUES

PARAMETER	ANALYTICAL TECHNIQUE/METHOD
[redacted]	
Ag, Sr, V, Zn	
Hg, Ti	AA
[redacted]	
Ni, K, Se, U	
[redacted]	
CO_3	Nonindispersive Infrared Analysis
[redacted]	
TCLP Test	40 CFR Part 261 Appendix II
Flow (Makeup Water and Wastewater)	In-Line Flow Monitors
[redacted]	
Indiana Neutral Leaching Method Test	Indiana Solid Waste Management Board Rules and Regulations
Mean Particle Size	20 Minimum per Sedigraph 5000D Plus Sieve Analysis
[redacted]	
Oil and Grease	40 CFR, Part 136
Opacity	CEM

[redacted]

POTENTIAL CHEMICAL AND PHYSICAL
PARAMETERS TO BE ANALYZED AND ANALYTICAL TECHNIQUES

PARAMETER	ANALYTICAL TECHNIQUE/METHOD
Particulate Matter	40 CFR 60 Appendix A, Method 5b or 17
pH	pH Meter and Electrode
Phenols	Gas Chromatography/Mass Spectrography
PM-10	
[redacted]	
SO_2	40 CFR 60 Appendix A, Method 6c or 19
[redacted]	
SO_3/H_2SO_4	[redacted]
Solid Dissolution Procedures	Nitric Acid-Hydrogen Peroxide Dissolution; Lithium Borate Fusion
Specific Surface Area	4-Point BET Analysis
TDS, TSS	40 CFR Part 136
Temperature	Thermometer
Unburned Hydrocarbons	EPA Method 25A

[redacted]

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BAILLY GEN ST ADVANCED FLUE GAS
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AND PHYS RAM TO BE MONITORED

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id		C ed D at iod	C mposite of Three S amp es
O_3			
st		L e r APC-200 Test	C mposite of Three S amp es
O_3 is ,	e eral/		
at		H L Outlet	C mposite of Three S amp es
O_3 ,	/		

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BAILLY GE NG ON ADVANCED FLUE GAS
FUR ON PROJECT

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AND PH PAR RS TO BE MONITORED

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BAILLY GE S D D FLUE GAS

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WES in	e of Three les
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ut ion For nt Coal	e of Three les
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l O n Di		
, T ture		Continuous
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uen Chlorine		Report
ate		24 hour c

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5			8 hour composite
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eral fate			24 hour composite
Oil			Grab
w			24 hour total
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nburned Hydroca s					EPA	25A
article Size Di bution	PM-1				Casc 201)	actor (EPA M nod
O_x					EPA	7 Series
O_2					Cont	Emission Mon or

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AIR, RTHERN INDIANA
BAILLY GE ING TION ADVANCED FLUE GAS
LFUR TION PROJECT

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AND PHY PAR TERS TO BE MONITORED

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mei			EP thod /ITM-001
rne ca			EP thod 5A
icl Di tion (PM-10)			Ca e Imp ctor (EP/ Me 201) EP thod Series
			Co uous mission M nitor
H_2S			Co lled ondensat n
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Stream/Para s	Sam	Sampling Meth
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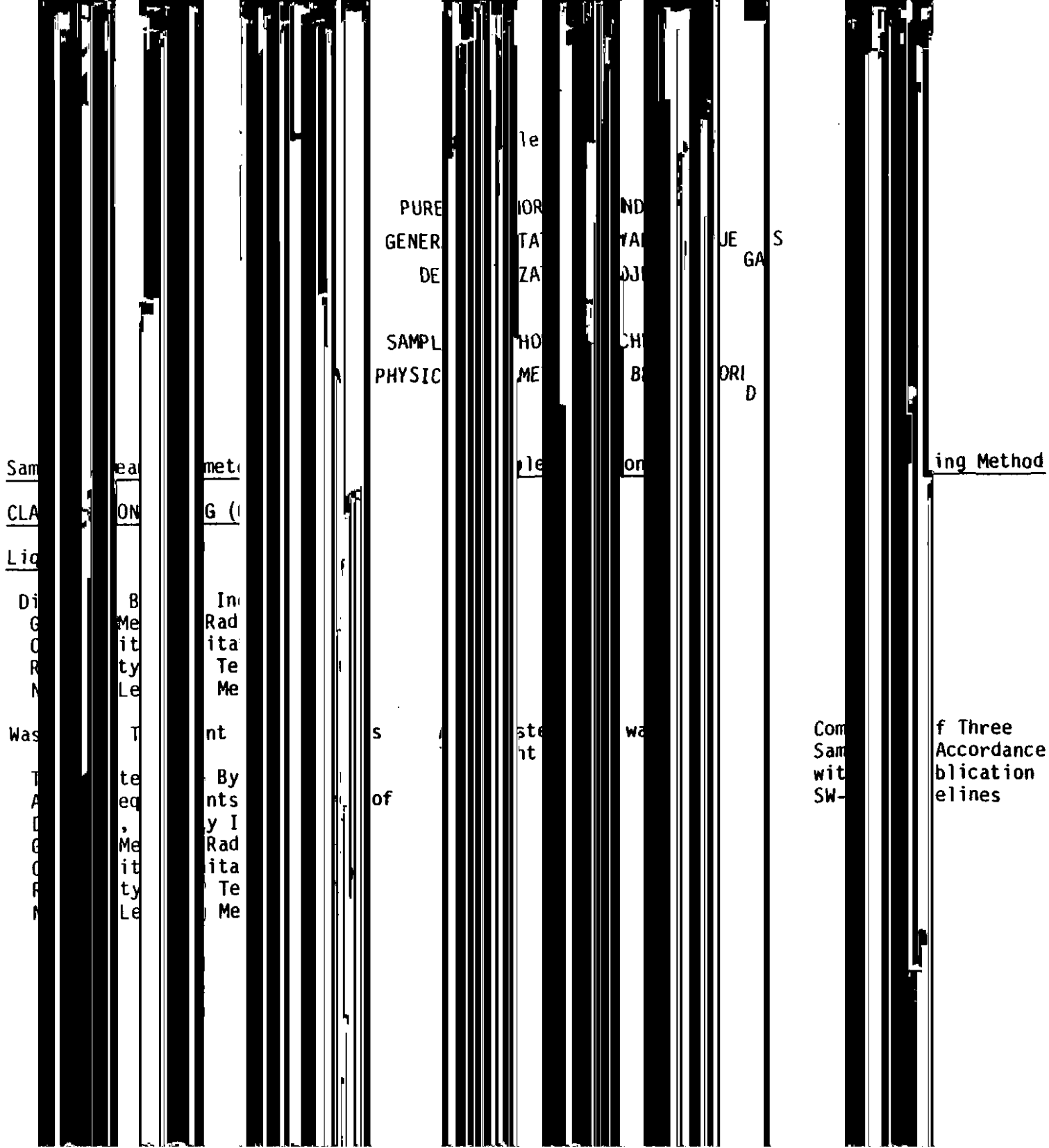
% Ash, Btu/ y		
	psu	Composite of Three Samples
Determined onsi Material, ay I al/Metals, acti sivity, Ign lity ivity, TCLP , In al Leaching od T		
	h S	Composite of Three Samples
Determined egul y Requireme nd M f		



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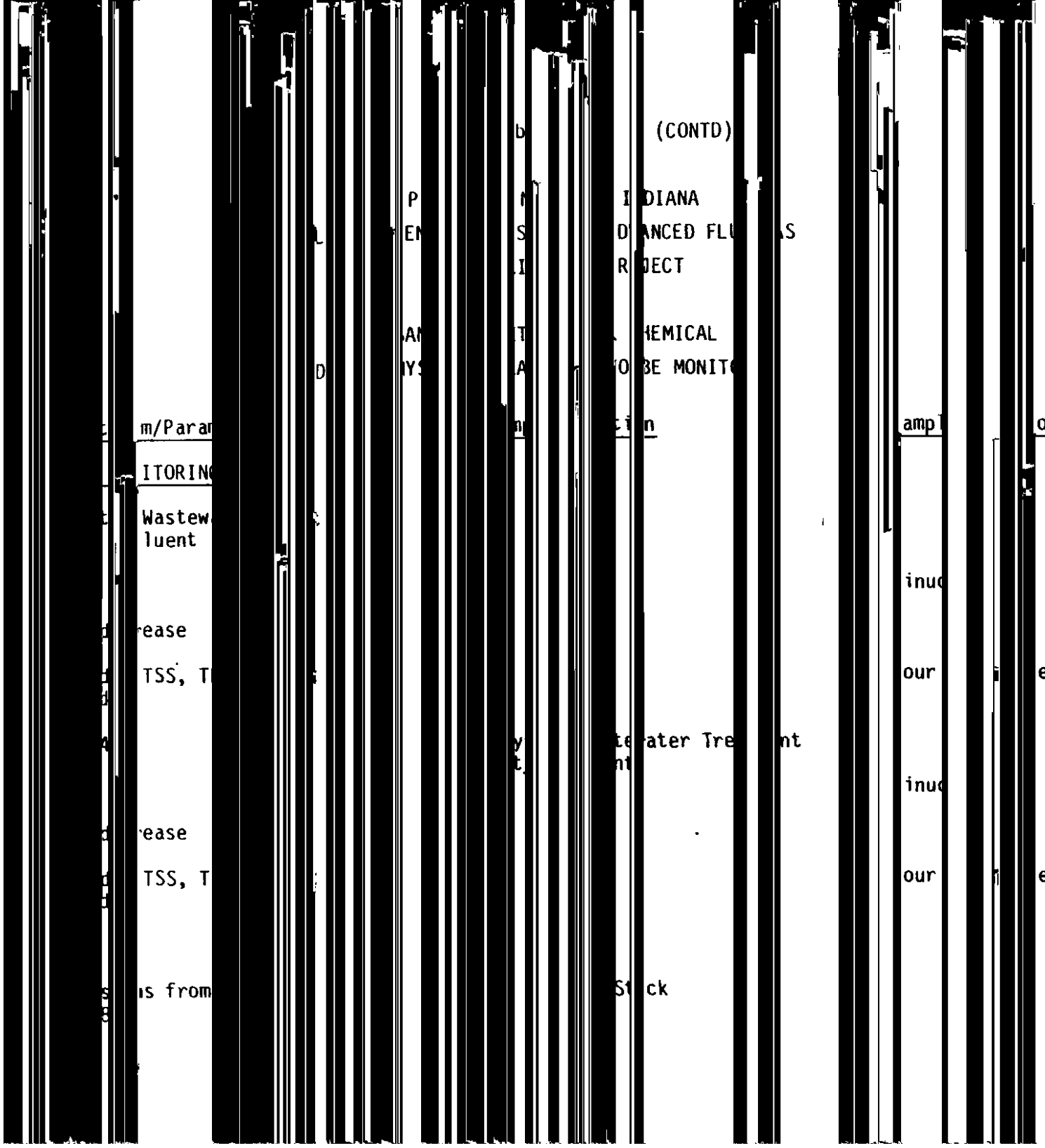

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acity			Continuo nissi n Monitor
rticu	ter		EPA Meth -5
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acity	A		Continuo nissi n Monitor
Emiss No. 8	m Unit No.	No. o ned Du s	
2, %			Continuo nissi n Monitor
Emiss	m AFGD Syst	Sys k	
2, %	2		Continuo nissi n Monitor
rticu	ter		EPA Meth -5

[redacted]

Sample St[redacted]	a[redacted]	m[redacted]	Locat[redacted]	Samp[redacted]	etho[redacted]
CLASS III[redacted]	I[redacted]				
Sound					
dBA, Le[redacted]	e[redacted]	m[redacted]	o[redacted] Bai[redacted] t[redacted] l Sur[redacted] d[redacted] ation[redacted]	Type 1 ([redacted] 1988 Integ[redacted] Meter Model Micro[redacted] 1560 or eq[redacted]	l Ra[redacted] Pre[redacted] Sou[redacted] naly[redacted] - 96 and Pre-[redacted]

Footnotes [redacted] G[redacted] C[redacted] a[redacted] consi[redacted] Li, M[redacted] h[redacted] g[redacted] lowi[redacted] Ni, [redacted] Ba, B, Be, [redacted] SO_4, Sulfide [redacted] , Cl[redacted] Sn, [redacted] o, Cu, V,

[redacted] R[redacted] r[redacted] v[redacted] analys[redacted] 6, [redacton-22[redacted] s[redacted] h[redacted] gros[redacted] -230[redacted] a[redacted] a, lead-210, [redacted] ium-

[redacted] T[redacted] yses i[redacted] s[redacted] Cd, [redacted] and Ag.

[redacted] I[redacted] a[redacted] N[redacted] l Leac[redacted] he ana[redacted] de as[redacted] h[redacted] r[redacted] Z[redacted] st is[redacted] follo[redacted] d pH.[redacted] without the [redacted] l, Cu, Cn, F[redacted] on o[redacted] Mn, [redacted] c acid hols,

Ta 6.2-4 (CONTD)

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HY PAR TERS T E MONITORED

e - A 24 hour e che N S perm consists of at l ree individual flow-propo s s whi are ta at approximate u ly spaced time intervals r pe d and ch are combined r o analysis.

f - Air metals s he fc wing: , As, Ba, Be, Cc, u, Pb, Mn, Ni, Se, Ag, and Zn.

° Documentation of all work on appropriate forms;

° Automatic system calibration check and data adjustment by computer system typically every 24 hours;

° Manual calibration of monitors or analyzer using a calibration gas (SO_2, O_2/CO_2) or standard (opacity) per criteria for initiating calibration;

° Monitor or analyzer drift determination and adjustment;

° Preventive maintenance including [illegible] chart recorders;

° Scheduled maintenance program including checking sample extractive systems, filters, lines and pump assemblies;

° Daily/bi-weekly/bi-monthly evaluation of appropriate monitoring data;

° Quarterly cylinder gas audits;

° Annual relative accuracy test audit;

° Initiation of corrective action when either the monitors/analyzers are out-of-control or the routine QA/QC checks indicate that there is a problem with a monitoring system, and

° Maintaining records and preparing periodic reports.

6.4.2 WASTEWATER DISCHARGES MONITORING QA/QC PROGRAM

Methods for ensuring quality assurance and quality control of

wastewater sampling will be incorporated into the standard methods

required to be an approved EPA laboratory and to participate in

- Annual analyses of spiked water samples from EPA containing

NPDES permit;

- permit;

- Routine QA/QC testing consisting of analyzing duplicate

including review with Bailly Station Manager and Chief

- QA/QC audit on outside laboratory.

6.4.3 SOLID AND SOLID WASTES MONITORING QA/QC PROGRAM

OSHWM's "Waste Sampling Guidelines" and "Laboratory Analysis

[redacted] and EPA's "Test Methods for Evaluating Solid [redacted]

expected to follow the procedures outlined in these documents and to have its own QA/QC program. The program will have the following general characterics:

- Participation in performance evaluation studies as a means of comparing analytical results;
- [redacted]
- [redacted]
- [redacted] instrumentation;
- Control charts for routine chemical analyses;
- Periodic submission of internal check samples for routine analyses, and
- [redacted]

6.4.4 SOUND LEVEL MONITORING QA/QC PROGRAM

[redacted]

used during the October, 1989 sound level survey.

During the October, 1989 survey, sound level measurements were taken with a Type 1 General Radio Model 1988-9700 precision

integrating sound level meter and analyzer, Model 1962-9610 microphone and Model 1560-P42 preamplifier. A General Radio Model GR1987 Minical 1 KHz sound level calibrator was used to calibrate

measurement period. All measurements were taken with the microphone approximately 5-ft above the ground surface, at a 70° angle above the horizontal towards the noise source. In addition, meteorological conditions were observed and recorded for each

with a cup anemometer. Throughout the measurement period, wind

The purpose for conducting industrial hygiene monitoring is to

designing and engineering controls and operating procedures to limit exposure, and periodically measuring control effectiveness

in operation, the industrial hygiene monitoring requirements may be modified.

6.5.2 EVALUATION CRITERIA

The Occupational Safety and Health Administration (OSHA) has

not law but are recommended guidelines by the American Conference

Most exposure criteria such as the OSHA PELs and the ACGIH TLVs

repeatedly, during an 8-hour day, 40-hour week, for a working lifetime without adverse health effects.

Chemical	Source	Exposure Limit
	respirable fraction	5 mg/m3
	ACGIH (TWA)	
	total dust	10 mg/m3
	ACGIH (TWA)	2 mg/m3

Calcium sulfate	OSHA (TWA) total dust	15 mg/m3
	total dust	10 mg/m3
Noise	OSHA (TWA)	90 dBA
	OSHA Hearing Conser. Amend. (TWA)	85 dBA

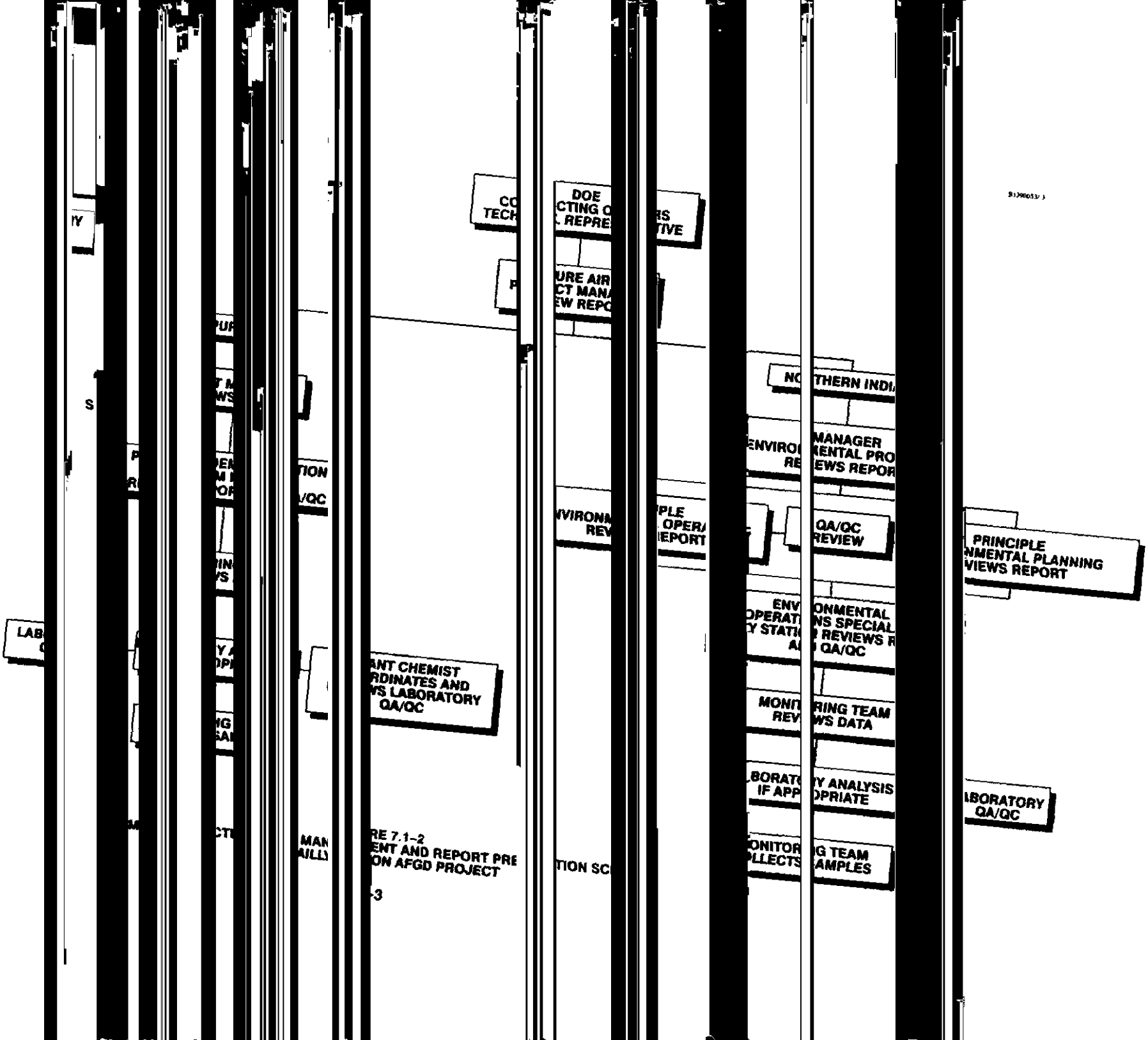
In those cases where exposure levels are not the same, the more stringent standard will be used to evaluate the measured exposure.

6.5.3 EXPOSURE MONITORING

the type and number of samples to be taken, as well as the

Sound level measurements and personal noise dosimetry measurements will be obtained. Hearing protection will be required for all employees working in areas where sound levels exceed 85 dBA.

established. Affected employees will receive annual audiograms and hearing conservation training. Noise exposure assessments


DOE
PRINCIPLE
QA/QC
LABORATORY QA/QC
RE 7.1-2
-3

During Phase 1, activities associated with environmental monitoring

will be analyzed for various parameters indicated in Table 6.0-1. In addition, the gypsum and ash generated from the tests will be analyzed for the parameters shown in Table 6.0-1.

7.2.2 PHASE 2 - CONSTRUCTION AND START-UP

This phase of the project also will involve minimal environmental monitoring. As indicated in Table 6.0-1, prior to start-up, hydrated

parameters. Also, Table 6.0-3 indicates that sound level measurements

PHASE 3 - OPERATIONS AND DISPOSITION

6.0-1, 6.0-2 and 6.0-3 will be conducted during this project phase. Monitoring will be conducted by both Pure Air and/or Northern

the ARAD system will allow for the correction on a routine basis of

and the ARAD system.

Emissions information will be collected from a monitoring system that

system. Additional emissions information will be provided by

7.3 MONITORING MEDIA

The environmental media to be monitored include solid, liquid, and gas streams. Tables 6.0-1, 6.0-2 and 6.0-3 summarize the sampling points,

Monitoring samples or data initially will be collected by either a Pure Air or a Northern Indiana Monitoring Team (Figure 7.1-2). If appropriate, samples will be sent to a laboratory for analyses. The

management personnel for review before being transmitted to DOE via Pure Air's Project Manager. Throughout the collection of samples, analyses

discussed in Section 6.4 Quality Assurance/Quality Control Program.

SECTION 8.0

DATA MANAGEMENT AND REPORTS

A Data Management System will be implemented in order to maintain

Data Management System will establish a consistent procedure for both AFGDs for (v

Reviews and checks will be built into the data management system by

Continuous Emissions Monitors (CEM's) will be stored on a personal computer (PC). Other data collected will be stored in hard copy form in

Resources for processing data will include experienced members of the

Environmental Programs Department may be used in assimilating data and reports.

8.2 REPORTING SCHEDULE

During Phase 3 of the project, environmental monitoring status reports

As previously described in Section 6 Environmental Monitoring, there are three classes of environmental monitoring associated with the AFGD

With management be (of) Ti 0 1.6443.6352 0 TD 3Tc 0.0802.0013264-0.045ex877iwnc (with) Ti 0 79.90 Tr 73.0969 0 TD40.5Tr

project. During the period of Class I Environmental Baseline or Characterization Monitoring, the parameters listed in Table 6.0-1 will be examined. Results of the APC-200 test will be documented after completion of the study, and summarized in the first quarterly report

yearly report.

A number of parameters collected (e.g., air emissions, wastewater

quarter throughout the demonstration period. The data collected as part of AFGD system operation, which are not routinely collected at the Bailly Station, will be summarized in a quarterly report as soon as possible and detailed in an annual report.

When Class II Compliance Monitoring begins, the gathered data will

years.

The data generated from the sound surveys conducted during Class III Supplemental Monitoring will be summarized as part of a quarterly

8.3 FORMAT AND CONTENT OF MONITORING REPORTS

reports with comments concerning compliance and data characteristics when

(Class II Monitoring), and 6.0-3 (Class III Monitoring). The analytical

to be as follows:

I. Overview of Quarter or Year

II.

B. Wastewater Discharges

C. Solid and Solid Waste Discharges

1. Products and By-products

D. Plant Operations

IV. Compliance

A. Compliance with Permit Limits

B. QA/QC

D. Modifications to Sampling or Analytical Methods

E. Other Miscellaneous Support for the Report

The contents of the report sections are briefly described below:

system operation will be discussed and the monitoring activities

8.3.2 SECTION II PROJECT STATUS

project will be described. This will include a description of the AFGD system process conditions for that quarter and the AFGD system operation for the next quarter also will be

8.3.2 SECTION III SOURCE EMISSIONS AND DISCHARGES

Monitoring data for the various environmental media will be summarized in this section of each quarterly report and detailed in the annual report. Emphasis will be placed on air emissions described below.

8.3.3.1 Air Emissions

opacity, percent of O_2 or CO_2) will be collected and stored on a PC with backup data recorded on strip charts. These data will be reduced and accessible via the PC. The SO_2 content of coal at the Bailly

appropriate station personnel. This information will

and archived. All of the data discussed above will be

laboratory will be received by the Station's Environmental Operations Specialist or Air Monitoring

Coordinator for retention.

Various parameters monitored with respect to wastewater discharges will be processed and reported at different intervals according to the Bailly Station operating permits. All of the data will be accumulated and organized in the reports similar to that reported to the Indiana Department of Environmental Management, Office of Water Management. A similar format will be used when makeup water monitoring is conducted.

[redacted]

solids, and other solid materials (e.g., coal, limestone, hydrated lime). The reporting of these data will be similar to that used for reporting air emissions or wastewater discharges laboratory data. Data from a laboratory will be initially forwarded to Northern Indiana's Environmental Operations Specialist or the Pure Air Monitoring Team. It then will be reviewed and incorporated in a report for further review/dissemination by appropriate project personnel.

8.3.3.4 Plant Operating Conditions

[redacted]

the time of a particular monitoring activity or when the WES is being tested.

8.3.4 SECTION IV COMPLIANCE

An evaluation of compliance with applicable permit limits will be included in each report. Excursions, if any, will be discussed in relation to AFGD system operations.

An integral part of determining compliance will be an evaluation of the QA/QC procedures. As shown in Figure 7.1-2, QA/QC checks will be performed at least two times on data as it passes through the Northern Indiana and Pure Air

project team hierarchy's of data management and reporting.

[redacted]

8.3.5 SECTION V PROBLEMS AND RECOMMENDATIONS

After commenting on monitoring data quality and discussing any problems with Bailly Station or AFGD system operations, the quarterly and final reports will include a section where recommendations will be made to rectify problems. Even if there are no problems during the demonstration period, [redacted]

8.3.6 SECTION VI APPENDICES

[redacted]

reports, the project will deal with this request on a case-by-case basis. Pure Air may not allow some process information to be released to [redacted] of the project, the DOE Contracting Officer's Technical Representative

[redacted]

information is forwarded to the CDTR, the information will have

[redacted]

information at Pure Air's headquarters.

MHI has an extremely strong United States patent position both in the overall FGD process as well as in specific areas of process technology. This involves significant MHI proprietary information which has been provided to Pure Air in sufficient detail to carry out the AFGD project. The project team intends to leave proprietary process information out of the environmental monitoring reports.

The types of process information considered proprietary include the

[redacted]

The types of information that are not considered proprietary include the

[redacted]

- flow rates of materials and stream temperature entering and leaving the overall process, and each major process step (e.g., consumption of coal, limestone and other feed streams),

- quantitative information on composition and flows for the existing Bailly Station streams for which the percent SO_2 can be calculated, and emissions of additional parameters (e.g., particulates);

- frequency of replacement of reagents or equipment since this can have major impact on process costs;

- [redacted] recycle streams is important to environmental monitoring;

- [redacted] is a significant consideration in the commercial potential of the process and environmental monitoring (e.g., where size [redacted]

SECTION 9.0

LIST OF PREPARERS AND PROFESSIONAL QUALIFICATIONS

9.1 AIR PRODUCTS AND CHEMICALS, INC.

Environmental Engineering Design for Air Products and Chemicals, Inc. Process System Group. He has over 20 years of industrial experience in chemical and refinery technology, process engineering, and environmental assessment, control and permitting. He has contributed to the published literature in the areas of environmental control and water and wastewater treatment, and is a recipient of the Harrison Prescott Eddy Medal from the Water Pollution Control Federation.

Reighard, Robert C., B.S. Ch.E.

Mr. Reighard, a Chemical Engineer, is the Director of Operations for Pure Air. He has over 20 years of industrial experience in PVC plant design, construction and maintenance; H_2, CO, O_2, N_2 and Ar industrial gas plant design, operation and maintenance; coal gasification technology; [illegible] desulfurization plant design. For 10 of the 20 years Mr. Reighard held positions as Plant Engineer and Plant Manager.

9.2 NORTHERN INDIANA PUBLIC SERVICE CO.

Ross, John M., B.A., M.B.A.

Mr. Ross is the Superintendent of Environmental Planning in Northern Indiana's project coordinator for the preparation of AFGD project

air monitoring system design and operation, estimation of air pollution

involved in the analysis of environmental regulation and policy to the

9.3 PURE AIR

Bolinsky, Francis T., B.S.

Brown, Gregory N., B.S.

Mr. Brown, a Process Engineer, is working on the process design for the

Heydorn, Edward C., B.S., M.S.

Mr. Heydorn, a Process Engineer, is the Principal Process Engineer for the AFGD project. He has over 10 years experience in the design and operation of industrial chemical facilities.

[redacted]

Mr. Brown, a Chemical Engineer, served as a Process Engineer for

[redacted]

and private utilities. Mr. Brown is a Registered Professional Engineer

[redacted]

Dennis, D. Steve, B.S., M.S., Ph.D.

Dr. Dennis, an Environmental Project Supervisor, coordinated the overall development of the EMP. He has over 10 years experience with

[redacted]

industrial projects throughout the United States.

APPENDIX A

BAILLY GENERATING STATION AND AFGD PROJECT ENVIRONMENTAL PERMITS

- BAILLY GENERATING STATION PERMIT FOR OPERATION OF AIR POLLUTION CONTROL FACILITIES

- AFGD SYSTEM PERMIT FOR CONSTRUCTION OF AIR POLLUTION CONTROL FACILITIES

BAILLY GENERATING STATION
PERMIT FOR OPERATION OF
AIR POLLUTION CONTROL FACILITIES
(DATE ISSUED APRIL 5, 1989)

Indianapolis, Indiana 46225

Northern Indiana Public Service Company
Bailly Generating Station
at Burns Harbor
Chesterton, Indiana

is hereby authorized to operate

the cyclonic (subcritical) coal fired boiler (Unit #7), rated at 1638 million

precipitator. Controlled boiler emissions are exhausted to the atmosphere

conditions:

1. That the data and information supplied in the application shall be considered

2-1-1, this change must be approved by the Office of Air Management.

3. That the equipment shall be operated and maintained in accordance with the manufacturer's specifications.

April 5 1989

Expiration Date July 1, 1992

Issued by James W. Kunz
Commissioner

State Form 37078 R

Conditions Continued:

4. That pursuant to 326 IAC 6-2 Section 1(b), particulate matter emissions to the atmosphere

5. That pursuant to Section 4 (e) of 326 IAC 2-1, stack tests to determine particulate matter

1992. The Office of Air Management (OAM) shall be notified of the test dates in advance pursuant with 326 IAC 3-2-3, and test reports shall be submitted to the OAM within 45 days

(Note: Analysis based on composite samples for weekends and holidays will be acceptable.) The above analysis will include all of the following on an as bunkered or as burned basis: heat

of the quarter shall be submitted by the last day of the month following the end of the quarter.

8. That visible emissions shall be limited to 40% opacity pursuant to 326 IAC 5-1, Section 2(a)(1), for attainment areas.

occurrence. This report shall also include the total accumulated periods of excess

10. That at no time shall the combined rate of heat input for Boiler Nos. 7 and 8 exceed a total of

OPERATION PERMIT
OFFICE OF AIR MANAGEMENT

Control No. 2015

Indianapolis, Indiana 46225

Northern Indiana Public Service Company
Bailly Generating Station
at Burns Harbor
Chesterton, Indiana

the cyclonic (critical) coal fired boiler (Unit #8), rated at 3374 million

through a 400 foot tall stack having a 16.5 foot exit diameter that is shared with Unit #7.

This permit is issued under provisions of 326 IAC Article 2 with the following conditions:

1. That the data and information supplied in the application shall be considered

2. That the permittee shall comply with the provisions of the Indiana Environmental Management Law (IC 13-7), Air Pollution Control Law (IC 13-1-1)

manufacturer's specifications.

Identification No. 64-07-92-0246 Date Issued April 5, 1989

July 1, 1992

Conditions Continued:

pursuant with 326 IAC 3-2-3, and test reports shall be submitted to the OAM within 45 days of the test.

6. That pursuant to 326 IAC 7-1-21 (a)(2), sulfur dioxide emissions from Boiler Nos. 7 and 8 shall be limited to 6.0 lbs./MMBtu. Boilers 7 and 8 shall be fired with coal, fuel oil or natural gas.

7. That the station shall sample and analyze the coal used in Boiler Nos. 7 and 8 on a daily basis (Note: Analysis based on composite samples for weekends and holidays will be acceptable.)

Records of the daily average sulfur content, heat content and sulfur dioxide emission rate (in

8. That visible emissions shall be limited to 40% opacity pursuant to 326 IAC 5-1, Section 2(a)(1), for attainment areas.

granted to allow, when necessary, the following visible stack emissions during boiler startups and shutdowns.

(a) During boiler startups an exemption from the 40% opacity limit is allowed for up

electrostatic precipitator reaches 250 degrees F, which ever occurs first. In the event that the above is exceeded due to special circumstances (such as a cold startup after an

(b) During boiler shutdowns an exemption from the 40% opacity limit is allowed for up

OPERATION PERMIT Control No. 2015

[redacted]

Chesterton, Indiana

[redacted]

This permit is issued under provisions of 326 IAC Article 2 with the following conditions:

1. That the data and information supplied in the application shall be considered [redacted]

Expiration Date July 1, 1992

Issued by [redacted]
Commissioner

State Form 37079 R

OFFICE OF AIR MANAGEMENT

Northern Indiana Public Service Company

Chesterton, Indiana

is hereby authorized to operate

the facilities associated with the fuel and dry flyash handling and storage systems, serving the coal fired boilers.

This permit is issued under provisions of 326 IAC Article 2 with the following conditions:

1. That the data and information supplied in the application shall be considered a part of this permit. Any change in the operation which will result in an increase in potential emissions exceeding those specified in 326 IAC 2-1-1, this change must be approved by the Office of Air Management.
2. That this source shall comply with the provisions of the Indiana Environmental Management Act (IC 13-7) and the Indiana Air Pollution Control Law (IC 13-1-1) as amended.
3. That the equipment shall be operated and maintained in accordance with the manufacturer's specifications.
4. That fugitive dust emissions shall comply with 326 IAC 6-4.

Identification No. 64-07-92-0248

Date Issued April 5, 1989

AFGD SYSTEM PERMIT FOR CONSTRUCTION OF AIR POLLUTION CONTROL FACILITIES

(DATE ISSUED MARCH 15, 1990)

105 South Meridian Street
P.O. Box 6015
Indianapolis 46206-6015
Telephone 317-232-8603

TO: All Permittees

FROM [redacted]

SUBJECT: Standard Permit Conditions

[redacted]

1. Pursuant to IC 13-7-10-2.5(b), IC 4-21.5-3-5(f), and IC 4-21.5-3-5(h),

[redacted]

petition for stay of effectiveness are filed, any part of the permit within the scope of the petition for stay is stayed an additional 15

[redacted]

Managmsnt.

CONSTRUCTION PERMIT

Control No. 772

[redacted]

NORTHERN INDIANA PUBLIC SERVICE COMPANY
BAILLY GENERATING STATION
NEAR CHESTERTON, INDIANA

is hereby authorized to construct

the Advanced Flue Gas Desulfurization (AFGD) system at the above location. This

[redacted]

units 7 and 8 flue gas stream, along with associated material handling and storage

[redacted]

THIS PERMIT IS ISSUED UNDER PROVISIONS OF RULE 326 IAC 2-1 WITH CONDITIONS LISTED

[redacted]

Identification No. PC (64) 1816

Expiration Date N/A

Date Issued 3/15/90

Issued by Timothy J. Method
Commissioner

State Form 37080 R

Advanced Flue Gas Desulfurization System
PC (64) 1816

Construction Permit Conditions

1. That this permit to construct does not relieve Northern Indiana Public

2. That the data and information supplied with the application shall be

3. That the equipment shall be installed in accordance with the manufacturers

5. (a) That pursuant to 326 IAC 3-1-8(1)(B), instruments for continuous monitoring and recording of AFGD system sulfur dioxide outlet emissions shall be installed. The oulet monitor shall be located in the new AFGD

be used for informational purposes only to provide data on % SO2 removal thru the AFGD scrubber.)

monitoring and recording of outlet percent oxygen or carbon dioxide (necessary to convert sulfur dioxide continuous monitoring data to the units

(b) That instruments for continuous monitoring and recording of inlet

monitored. (Note: The inlet monitor is to be used for informational purposes only to provide data on % SO2 removal thru the AFGD scrubber.)

7. That pursuant to 326 IAC 3-1-8(1)(A), instruments for continuous monitoring and recording of opacity from Unit 7 and Unit 8 shall be installed. These continuous opacity monitors shall be located in the individual unit ducts downstream of the ESP's but upstream of the AFGD system combined flow duct in a location that meets the EPA's continuous emission monitor location guidelines. Data from these opacity monitors shall not be combined but recorded and reported separately.

Operation Conditions

Emission Limitations

1. That sulfur dioxide emissions from the AFGD system stack shall be limited to 1.2 pound per million Btu's of energy input. (This rate was used in the

2. That pursuant to 326 IAC 6-2-1(b), particulate matter emissions to the

(b) That instruments for continuous monitoring and recording of sulfur dioxide combined Unit 7 and 8 AFGD scrubber inlet emissions shall be certified, calibrated, maintained and operated. (See Construction condition

only to provide data on % SO2 removal thru the AFGD scrubber.)

(b) That instruments for continuous monitoring and recording of combined Unit 7 and 8 AFGD scrubber inlet percent oxygen or carbon dioxide (necessary

monitor is to be used for informational purposes only to provide data on %

6. That pursuant to 326 IAC 3-1-8(1)(A) instruments for continuous monitoring and recording of opacity from Unit 7 and Unit 8 shall be installed,

These opacity monitors shall be located in the individual units ducts

daily basis. The above analysis will include the heat content and %S on an

(initial operation is defined as the first time the AFGD is in operation removing SO2 from a Unit 7 or 8 flue gas stream) with another test to be conducted during calendar year 1994 (or in the second calendar year

system and the Wastewater Evaporation System (WES) in service. If the WES

greater load during the test. (As an alternative each unit may be tested

excluded from the calculation of the daily average but shall be reported on

Conditions Continued:

9. (Continued)
A separate 30-day rolling weighted average shall be maintained for the AFGD stack and the [redacted] which there is a period of more than one hour during which either stack is [redacted]

Reporting Requirements

10. That pursuant to 326 IAC 3-1-10 reports of the time, duration, magnitude and cause of periods of excess emissions (as below) or monitor malfunctions shall be submitted to the OAM on a quarterly basis as follows:

a) all periods of excess (greater than 40%) opacity in percent(%), on a [redacted]

Btu's on a block three-hour average basis, during periods when the three hour average outlet SO2 emission rate exceeds 1.2 lbs/MMBtu's; [redacted]

- date;

- daily weighting factor (generation or coal burned);

Material Handling Requirements

12. That the limestone to be used in the AFGD system shall be pulverized to the [redacted]

13. That particulate matter emissions from each of the limestone and lime bin [redacted]

Advanced Flue Gas Desulfurization System
PC (64) 1816

Conditions Continued:

14. That dewatered gypsum will be transferred via an enclosed conveyor to an enclosed storage building.

15. That the fugitive dust plan as described on pages 5-1, 4-2, and 4-3 of the October 1989 document submitted by Northern Indiana, entitled "Fugitive Dust Control Plan - Addendum to Engineering Report", shall be implemented.

[redacted]

Operation of the AFGD system will be Pure Air's [redacted]

As indicated above, Northern Indiana will be responsible [redacted] implementing the vehicle resuspension fugitive emissions control plan. The Station's Coal Handling Department will be responsible for carrying out the specific plan activities and for maintaining [redacted]

permit conditions.

[redacted]

15 ton/yr, respectively) with either 4.5 or 3.0 percent sulfur coal. This is summarized in Table 4-1.

In order to control fugitive particulate emissions from [redacted] the following procedures will be implemented:

1. The total approximate 3.2 mile roadway shown on Drawing [redacted] week basis. Based on a control efficiency presented in the Ohio EPA document entitled, Reasonably Available Control Measures for Fugitive Dust Sources (September 1980), this activity will yield an efficiency of 80 percent emissions reduction.

2. A high pressure water flushing truck such as that manufactured by Klein Equipment, Inc., TX, Model No: D600 will be used to wash the roadway surface.

[redacted] a minimum of 0.1 inch of rainfall assumed during

representative of onsite conditions.

b. It is raining at the time of the scheduled water flushing.

BAILLY GENERATING STATION/AFGD
SYSTEM NPDES PERMIT
MODIFICATION FOR WASTEWATER DISCHARGES
(DATE ISSUED MARCH 2, 1990)

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

RECEIVED

105 South Meridian Street

VIA CERTIFIED MAIL P 741 219 991

Mr. William R. Elliott, V. P.

Re: NPDES Permit No. IN 0000132
NIPSCO Bailly Station
Chesterton, Indiana

Dear Mr. Elliott

Your application for modification of the above-referenced discharge permit has been processed in accordance with Section 402 and 405 of the Federal Water

itemizes and explains the rationale for the revisions.

The enclosed NPDES Permit Amendment covers your existing NPDES

consistent with the terms and conditions of this permit, as amended.

to the final permit.

request must be filed in accordance with IC 4-21.5-3-7 and IC 13-7-10-5 and must include facts demonstrating that the party requesting appeal is the

requested under the provisions of IC 4-21.5 and IC 13-7-10.5.

If you have questions concerning this modification, please contact

[redacted]

Sincerely,

T.P. Chang for

Charles B. Bardonner
Assistant Commissioner
Office of Water Management

MWS/ssh

Enclosure

cc: Chief, Permit Section, U.S. EPA

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

AMENDED AUTHORIZATION TO DISCHARGE UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

[redacted]

NORTHERN INDIANA PUBLIC SERVICE COMPANY
BAILLY GENERATING STATION

[redacted]

December 6, 1988, is hereby amended, as contained herein. The amended provisions shall become effective April 1, 1990. All terms and 9

[redacted]

Charles B. Bardonner
Assistant Commissioner
Office of Water Management

5003p 9/25/89

and
requiremi 0

The discharger has a Class C industrial wastewater treatment plant, classified in accordance with 327 IAC 8-12 Classification of Water and

PART I

A. *EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS*

1. During the period beginning on the effective date of this permit and

Flow [2]	Report	Report	MGD	--	--		Daily	24-Hr. Total
Temperature [3]	Report	Report	°F	--	--		Daily	Continuous
Total Residual Chlorine+	--	--		--	0.2	mg/l	Daily [5]	Grab
Duration of Chlorination [4]	--	--		--	--		Monthly Report	
Chlorination Frequency [4]	--	--		--	--		Monthly Report	

[1] See additional requirements for the discharge of this

[2] Flow may be estimated by engineering calculations.

[3] See Other Requirements, Part III of Permit.

[4] Total Residual Chlorine (TRC) may not be discharged from any single generating unit (condenser) for more than two hours per day. Frequency and Duration of chlorination need only be

[5] During discharge of chlorine bearing wastewater.

2. The discharge shall not cause excessive foam in the receiving

3. The discharge shall not contain oil or other substances in

4. Samples taken in compliance with the monitoring requirements

2. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge from Outfall 100 - Miscellaneous Low Volume Bypass. Such discharges shall be limited and monitored by the permittee as

	Quantity or Loading			Quality or Concentration			Monitoring Requirements	
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
TSS	--	--		30	100	mg/l	Daily*	Grab
Oil & Grease	--	--		15	20	mg/	Daily*	Grab

*During discharge

a. The pH shall not be less than 6.0 nor greater than 9.0. The pH

b. The discharge shall not cause excessive foam in the receiving

amounts sufficient to create a visible film or sheen on the

but prior to mixing with other wastewaters.

[redacted]

Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow	Report	Report	MGD	--	--		Weekly	24-Hr. Total
TSS	--	--		20	30	mg/l	Weekly	24-Hr. Comp.

[redacted]

sampling is to be conducted daily.

b. The discharge shall not cause excessive foam in the receiving

[redacted] and settleable solids.

[redacted]

d. Samples taken in compliance with the monitoring requirements

[redacted]

T. Iron	--	--	--	1.0	mg/l	Daily*	24-Hr. Comp
T. Copper	--	--	--	1.0	mg/l	Daily*	24-Hr. Comp

wastes" means any wastewater (including chemical cleaning liquor,

cleaning. The volume of boiler cleaning waste to which these limitations apply is two boiler volumes, including the initial

40 CFR 423.12(b)(5) as a metal cleaning waste, is to be considered

but prior to mixing with other wastestreams.

Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow (MGD)	Report	Report		--	--		Weekly	24-Hr. Total
BOD_5	--	--		30	45	mg/l	Weekly	8-Hr. Comp.

through October 31 annually. Disinfection is not required, and chlorination should not be practiced November 1 through March 31

Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Oil & Grease	--	--		15	20	mg/l	2 X Monthly	Grab

b. The discharge shall not cause excessive foam in the receiving waters. The discharge shall be essentially free of floating

c. The discharge shall not contain oil or other substances in

shall be taken at a point representative of the discharge

Parameter	Average	Maximum	Units	Average	Maximum	Units	Frequency	Type

shall be monitored as follows: by a weekly grab sample, during periods of discharge.

b. The discharge shall not contain oil or other substances in

8. During the period beginning on the effective date of this modification and lasting until the expiration date, the permittee is

Flow	Report	Report	MGD	--	--	--	2 X Weekly	24-Hr. Tota
TSS	--	--	--	30	100	mg/l	2 X Weekly	24-Hr. Comp
Oil & Grease	--	--	--	15	20	mg/l	Monthly	Grab
Chloride								
[2]	--	--	--	Report	Report	mg/l	2 X Weekly	24-Hr. Comp
Sulfate								
[1]	--	--	--	Report	Report	mg/l	2 X Weekly	24-Hr. Comp
[2]	--	--	--	52	100	mg/l	2 X Weekly	24-Hr. Comp
Fluoride								
[1]	--	--	--	Report	Report	mg/l	2 X Weekly	24-Hr. Comp

of these pollutants, after mixing of the effluent of Outfalls 401 and 001. This should be determined by actually measuring these concentrations at Outfall 001, after mixing of all wastestreams. No credit for net discharge will be considered for these pollutants.

a. The pH shall not be less than 6.0 nor greater than 9.0. The pH shall be monitored as follows: by a grab sample twice weekly.

but prior to mixing with other wastestreams.

c. The permittee is strongly encouraged to exercise the option of

B. MONITORING AND REPORTING

1. Representative Sampling

2. Reporting

The permittee shall submit discharge monitoring reports (DMR-1 Form) to the Indiana Department of Environmental Management containing

effective.

Environmental Management for relief from reporting requirements. The Commissioner may then suspend reporting requirements without public notice or opportunity for public hearing.

The Regional Administrator may request the permittee to submit

Monthly Average:

the number of days in the calendar month

the pollutant daily discharges by weight divided by the number of days during the calendar month when the measurements were made.

(2) Concentration Basis - The "monthly average" concentration means the arithmetic average (weighted as directed at 40

daily determination of concentration shall be the

(1) Weight Basis - The "daily maximum" discharge means the total discharge by weight during any calendar day.

(2) Concentration Basis - The "daily maximum" concentration means the daily determination of concentration for any calendar day.

approximately equally spaced time intervals during a 24-hour period and which are combined prior to analysis.

d. Concentration--The weight of any given material present in a

Administrator, U.S. EPA, located at 230 South Dearborn Street, Chicago, Illinois 60604.

The analytical and sampling methods used shall conform to the current version of 40 CFR, Part 136. The approved methods may be included in the texts listed below. However, different but equivalent methods are allowable if they receive the prior written

Washington, D.C. 20005.

(2) A.S.T.M. Standards, Part 23, Water; Atmospheric Analysis

(3) Methods for Chemical Analysis of Water and Wastes June 1974, Revised, March 1983, Environmental Protection Agency, Water Quality Office, Analytical Quality Control Laboratory, 1014 Broadway, Cincinnati, OH 45202.

this permit, the permittee shall record the following information:

[redacted]

d. The analytical techniques or methods used, and

e. The results of all required analyses.

6. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, [redacted]

[redacted]

All records and information resulting from the monitoring activities [redacted]

minimum of three (3) years, or longer, if requested by the Regional Administrator or the Indiana Department of Environmental Management.

C. REOPENING CLAUSE

[redacted]

limitations for the control of such discharges.

[redacted]

compliance, if necessary, after final promulgation and effectiveness of revised Indiana Water Quality Standards.

0 ET BT 0.906tl83 074 Tcrm(the) Ti 0 Tr 24.8953 0 Tw (monito7 0.1277 Tw (monitoring ry4r /F0 10.8 Tf 0.0866 Tc 0.0802ah

PART II
STANDARD CONDITIONS FOR NPDES PERMITS
FOR INDUSTRIAL FACILITIES

SECTION A. GENERAL CONDITIONS

1. Duty to Comply

Pursuant to the Indiana Environmental Management Act, any person who violates

and "Upsets," Section B, Paragraph 3, nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or correct any

4. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause.

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

[redacted] changes or anticipated noncompliance does not stay any permit condition.

5. Duty to Provide Information

The permittee shall furnish to the Commissioner, within a reasonable time, any information which the Commissioner may request to determine whether cause [redacted] permit.

6. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after [redacted] permit expiration date.

7. Transfers

This permit is nontransferable to any person except after notice to the Commissioner pursuant to Regulation 327 IAC 5-2-6(c). The Commissioner may [redacted]

8. Toxic Pollutants

[redacted] standard or prohibition) is established under Section 307(a) of the Clean [redacted]

The permittee shall comply with effluent standards or prohibitions established [redacted] incorporate the requirement.

9. Containment Facilities

When cyanide or cyanogen compounds are used in any of the processes at this facility, the permittee shall provide approved facilities for the containment of any losses of these compounds in accordance with the requirements of Water Pollution Control Board Regulation 327 IAC 2-2-1.

[redacted]

[redacted] and Hazardous Substance Liability

12. Property Rights

[redacted]

[redacted]

14. Inspection and Entry

The permittee shall allow the Commissioner, or an authorized representative, [redacted] law, to:

[redacted] under the conditions of this permit;

[redacted]

c. Inspect at reasonable times any facilities, equipment (including [redacted]

[redacted] permit compliance or as otherwise authorized by the Clean Water Act

[redacted]

SECTION B. MANAGEMENT REQUIREMENTS

1. Proper Operation and Maintenance

treatment which are installed or used by the permittee and which are necessary

a. Definitions:

(1) "Bypass" means the intentional diversion of a waste stream from any portion of a treatment facility normally utilized for

natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean

(1) bypass is unavoidable to prevent loss of life, personal injury or severe property damage;

(if this information is provided orally, a written submission

commissioner, if possible, at least ten days before the date of the bypass.

c. An anticipated bypass which meets the three criteria of Paragraph b

3. Upset Conditions

a. Definition: "Upset" means an exceptional incident in which there is

to the extent caused by operational error, improperly designed

defense to an action brought for noncompliance with such technology

(1) An upset occurred and the permittee has identified the specific cause(s) of the upset, if possible;

and

(3) The permittee complied with any remedial measures required

4. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed from or

manner such as to prevent any pollutant from such materials from entering waters of the State and to be in compliance with all Indiana statutes and regulations relative to liquid and/or solid waste disposal.

SECTION C. REPORTING REQUIREMENTS

1. Planned Changes in Facility or Discharge

Any anticipated facility expansions, production increases, or process modifications which will result in new, different, or increased discharges of pollutants must be reported by submission of a new NPDES application or, if such changes will not violate the effluent limitations specified in this

following such notice, the permit may be modified to revise existing pollutant limitations and/or to specify and limit any pollutants not previously limited.

[redacted]

b. Violation of a maximum daily discharge limitation for any of the pollutants listed by the Commissioner in the permit to be reported within 24 hours; and

c. Any noncompliance which may pose a significant danger to human health or the environment.

A written submission shall also be provided within 5 days of the time the [redacted]

[redacted]

6. Other Information

[redacted]

information.

7. Changes in Discharge of Toxic Substances

The permittee shall notify the Commissioner as soon as it knows or has reason to believe:

a. That any activity has occurred or will occur which would result in the discharge of any pollutant identified as toxic, pursuant to Section 307(a) of the Clean Water Act which is not limited in the

(1) One hundred micrograms per liter (100 ug/l);

milligram per liter (1 mg/l) for antimony;

(4) The level established in Part III of the permit by the Commissioner.

intermediate or final product or byproduct any toxic pollutant which was not reported in the permit application.

8. Signatory Requirements

a. All reports required by the permit and other information requested by the Commissioner shall be signed and certified by a person described below or by a duly authorized representative of that person:

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a Federal, State, or local governmental body or an agency or political subdivision thereof: by either a principal executive officer or ranking elected official.

(1) The authorization is made in writing by a person described above.

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. (A duly authorized individual occupying a named position.), and

(3) The authorization is submitted to the Commissioner

shall make the following certification:

"I certify under penalty of law that I have personally examined

individuals immediately responsible for obtaining the

fine and imprisonment.

9. Availability of Reports

Board Regulation 327 IAC 12, all reports prepared in accordance with the terms

10. Penalties for Falsification of Reports

The Indiana Environmental Management Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or

violation, or by both.

A. Thermal Effluent Requirements

As a result of approval of the 316(a) demonstration study submitted in September 1976, no thermal effluent limitations are included in this permit. Indiana Water Quality Standards (IWQS) for temperature are

thermal discharge.

No further submission of information on this subject is required at the time of reissuance of this permit.

C. Chlorine Concentration

The total exposure time of TRC resulting from chlorination of the

D. Intake Screen Wash

amounts sufficient to be unsightly or deleterious, or which will produce

There shall be no discharge of polychlorinated biphenyl (PCB) compounds such as those commonly used for transformer fluid, in accordance with

Briefing Memo
September 22, 1989

NIPSCO - Bailly Generating Station
246 Bailly Road
Chesterton, Indiana 46304
NPDES Permit No. IN 0000132

Background

The NPDES permit for this facility was renewed September 29, 1988, and

company between Air Products and Chemicals, Inc., and Mitsubishi Heavy

Two wastestreams will be generated by this operation: sanitary wastewater and process wastewater from the scrubber itself. The sanitary wastewater will be discharged to the existing NIPSCO sanitary wastewater treatment plant (STP)

characteristically high in TSS and TDS. Plans are to discharge this wastestream to the cooling wastestream (Outfall 001) for mixing prior to

effluent between the Unit 8 air preheater and the electrostatic precipitator

The permit is being modified to include a new Outfall 401 for the discharge of the treated AFGD process wastewater to the cooling water wastestream prior to its ultimate discharge to Lake Michigan. Effluent limitations are proposed for TSS, oil and grease, chloride, TDS, sulfate, fluoride and pH. A new page 1 is included to reflect this modification. A [redacted]

Pollutants	Mo. Ave.	Daily Max.

[redacted]

concentrations as predicted by the permittee. This change has come about due to the ongoing activity surrounding the revisions to the Indiana Water Quality [redacted]

Waters" (327 IAC 2-1) would apply. The current proposal for revision of [redacted]

[redacted]

The actual limitations for these four pollutants apply at Outfall 001, [redacted]

Expiration Date

This modification will expire August 31, 1993, as with the current permit.

0813B 10/16/89

Post Public Notice Addendum 12-4-89 M.W. Stanifer Revised 3-1-90 MWS

During the public notice period, comment letters were received from the

1. pH monitoring at outfalls 301 and 401 (Pages 7 and 9); The permittee's

2. Sampling frequency for dissolved solids at 401 (Page 9); the permittee's

operation, if such results demonstrate adequate compliance. Such modification would require public notice.

401 (page 9). IDEM believes that the permit is clear that the limitations for the various dissolved solids and pH are only applicable after mixing with other wastestreams and are not applicable at the point of discharge to the

4. As with comment 2, IDEM will entertain a request to review (and reduce) monitoring frequencies after a period of substantial compliance has been demonstrated. Also, as with the other previous responses, no change has been made in the permit.

5. The permit (page 9) has been revised to clarify that sampling for the parameters prescribed at outfall 401 is required only during periods of

6. IDEM accepts NIPSCO's comments regarding the experimental nature of the

results of the initial test operational period regarding this matter prior to

(1.5 mg/l) was incorrect. The permit limitation of 1.4 mg/l is the correct value. This is in accordance with agency policy to maintain continuity of the records, the Briefing Memo as drafted has not been altered.

U.S.EPA Region 5 submitted a comment letter dated Jan. 23, 1990 which contained three comments on the draft permit. The Region 5 comments and IDEM responses are summarized as follows:

the discharge on Lake Michigan.

While this subject was touched upon in the original Briefing Memo, it

quality of Lake Michigan, so long as the effleunt limitations are consistently

2. Region 5 commented that the original Briefing Memo "did not discuss the

be recalculated accordingly. IDEM contends that since the permit intentionally does not provide for net limitations, or credit for quantities of these same pollutants which are present in the intake or from other sources

3. Region 5 noted that the monthly average concentration limit for TDS should be 344 mg/l as stated in the Briefing Memo rather than 394 mg/l. This error has been corrected.

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