

Appendix 4.D Existing Generation Units

The following appendices comprise Appendix 4.D:

Appendix 4.D.1: Combustion By-Product Restrictions

Appendix 4.D.2. Water-Related Restrictions (Cooling Towers and Fish Impingement Control)

Appendix 4.D.3. Other Air Pollutants

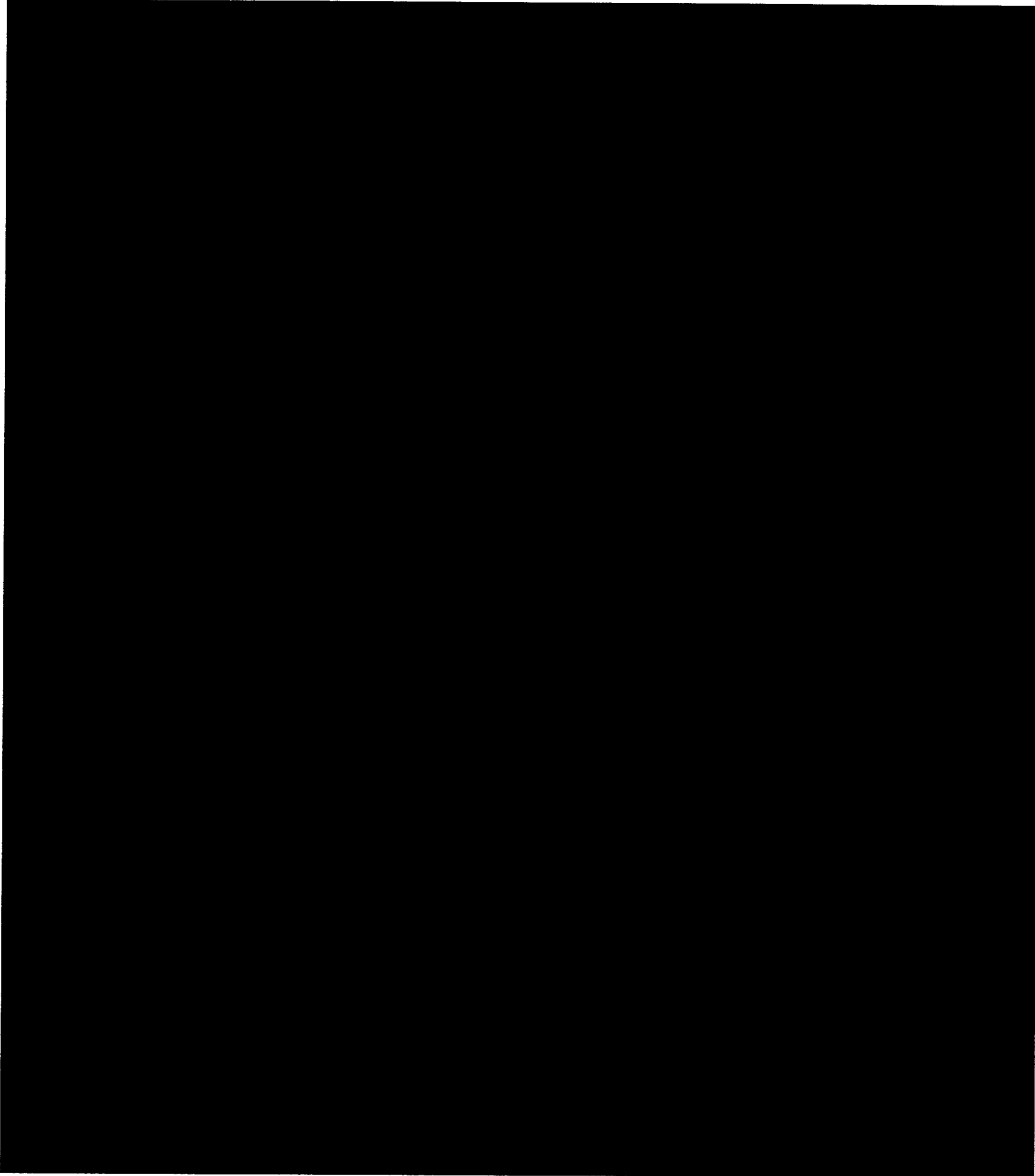
Appendix 4.D.4. Zebra Mussels

Appendix 4.D.5: Probable Environmental Costs (Existing Units)

Appendix 4.D.6: Plant Efficiency Study

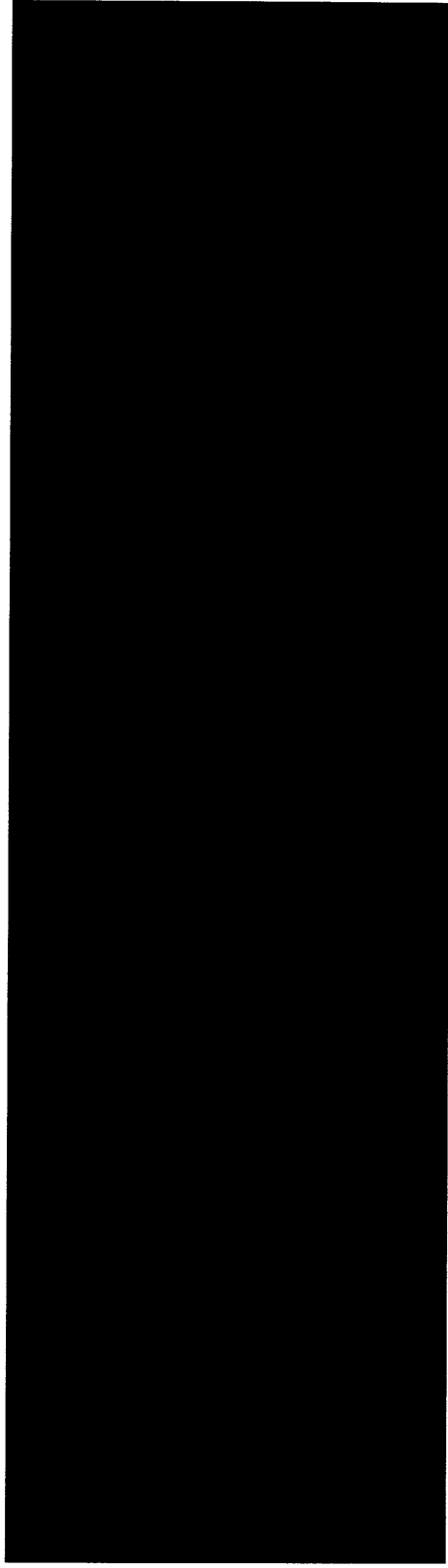
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Appendix 4.D.1: Combustion By-Product Restrictions
****Highly Confidential****



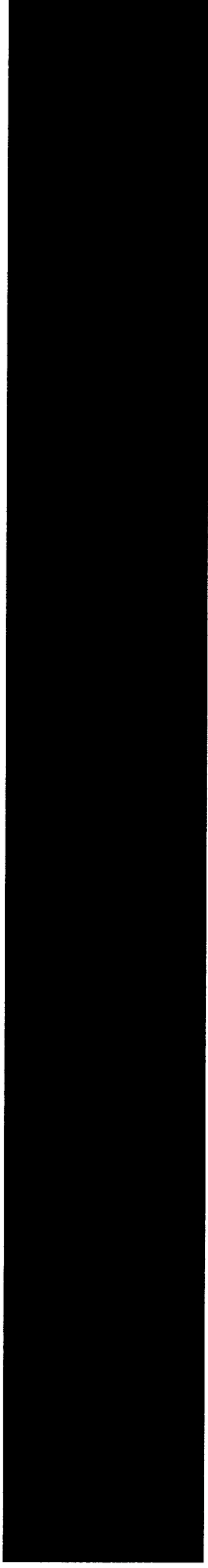
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Appendix 4.D.2. Water-Related Restrictions (Cooling Towers and Fish Impingement Control)Highly Confidential****



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Appendix 4.D.3. Other Air PollutantsHighly Confidential****



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Appendix 4.D.4. Zebra Mussels

KCP&L IRP ZEBRA MUSSEL PLAN

There are two commonly used options available for zebra mussel control. They are chemical treatment with chlorine (or a commercially available molluscicide) and mechanical scraping of the mussels to remove them from the effected system. The former option is used both for preventative treatment and removal while the latter option is a removal option solely. Therefore, the chemical option will be the recommended course of action.

While chemical treatment should not be the foremost solution for zebra mussel control, it is probably the most common method used. Presently, chlorine is the chemical of choice for controlling zebra mussels in industrial and municipal water facilities. Chlorine can be used as either gaseous chlorine or in liquid form as sodium hypochlorite (bleach). The liquid form is generally considered the safer method to feed chlorine.

KCP&L's environmental discharge permits (NPDES) contain a provision for using chlorine in the circulating water systems. This provision limits the ~~fed~~erate to be no more than ** [REDACTED] ** a day per unit and for our discharge to be below ** [REDACTED] ** ppm. It should be noted that new permits are expected to have the limit dropped to ** [REDACTED] ** ppm. This is a problem in that the levels of chlorine needed to be effective are approximately ** [REDACTED] ** ppm and for that level to be fed either continuously for anywhere from ** [REDACTED] ** (there is an optional method which is reported to be successful at times but it is an alternating 20 minutes off and on process for this same period of time.

Consequently, it would be necessary to "de-chlorinate" the circulating water system to meet environmental regulations. Therefore, the estimate given below are broken down into capital costs for both the chlorination and de-chlorination feed equipment and monitoring equipment and the annual O&M costs for the chemicals.

HAWTHORN STATION (Units #5 & #9)

Capital costs: ** [REDACTED] **

O&M costs: ** [REDACTED] **

IATAN STATION (Units #1 & #2)

Capital costs: ** [REDACTED] **

O&M costs: ** [REDACTED] **

LA CYGNE STATION (Units #1 & #2)

Capital costs: ** [REDACTED] **

O&M costs: ** [REDACTED] **

MONTROSE STATION (Units #1, #2 & #3)

Capital costs: ** [REDACTED] **

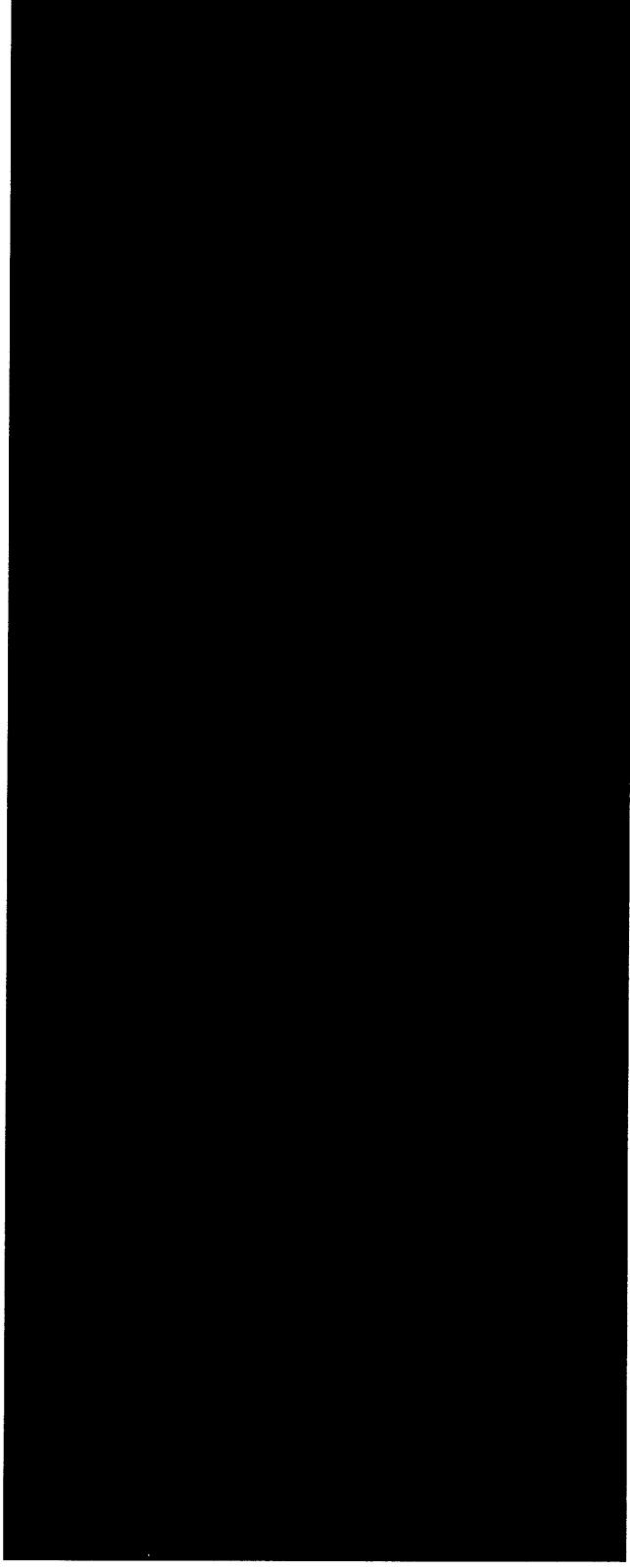
O&M costs: ** [REDACTED] **

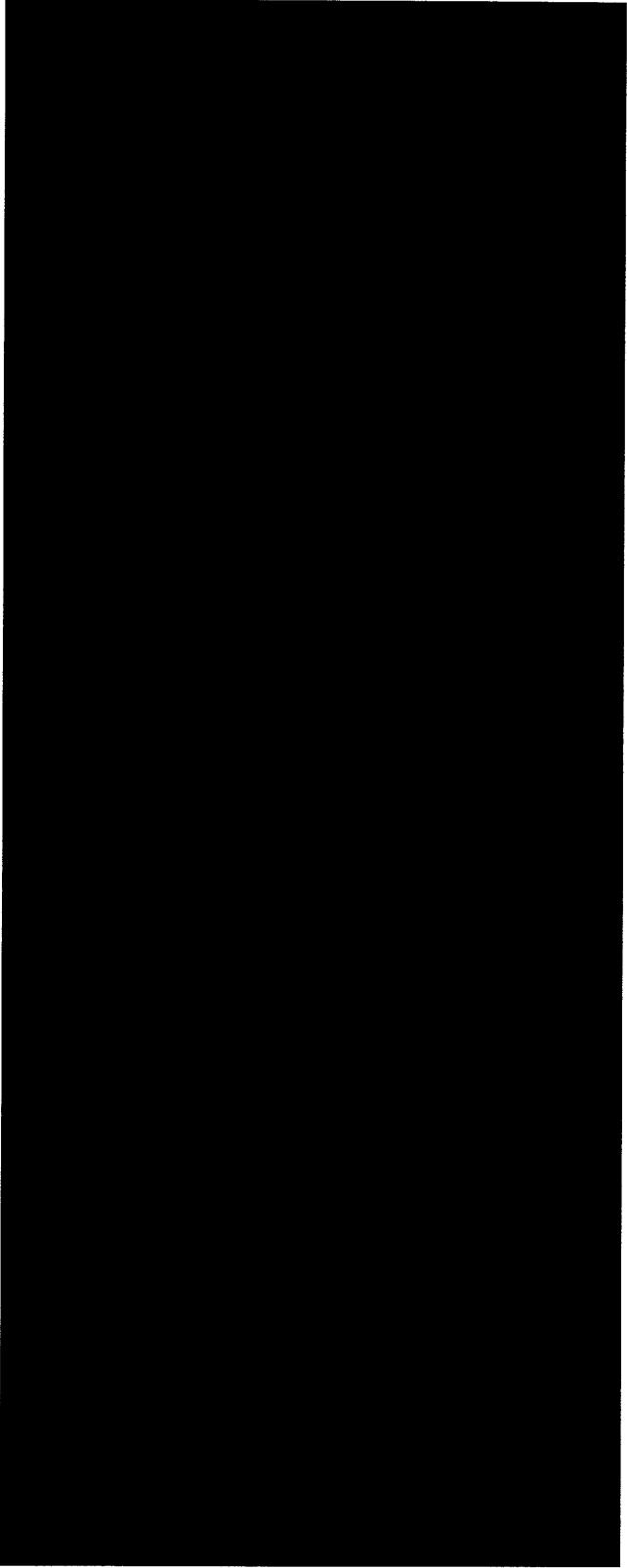
Highly Confidential



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Appendix 4.D.5: Probable Environmental Costs (Existing Units)Highly**
Confidential**







Appendix 4.D.6: Plant Efficiency StudyHighly Confidential****

Kansas City Power & Light
CO₂ – Plant Efficiency Improvement Assessment

B&V Project 147591
B&V File No. 10.0000
April 28, 2008

Attn: Mr. Lance Gockel
Kansas City Power & Light
PO Box 418679
1201 Walnut
Kansas City, MO 64141-9679

Subject: Project Report Submittal

Dear Mr. Gockel:

Black & Veatch is pleased to submit our project report for the CO₂ – Plant Efficiency Improvement Assessment. We appreciate the opportunity to be of service to Kansas City Power & Light and in particular this specific and strategic project. The attached report outlines our findings and suggested strategy to evaluate and compare economic opportunities for efficiency gains in plant operations.

We trust that this report submittal meets your expectations and needs. Should you have any comments, please feel free to contact me at (913) 458-7597.

Very truly yours,

BLACK & VEATCH

Phillip Webster
Project Manager

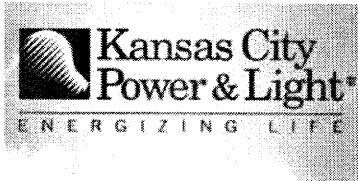
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Enclosure[s]

cc: Mike Irwin (KCPL)
Randy Hughes (KCPL)
Dave Brill (B&V)
Matt Wood (B&V)

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Kansas City Power & Light

CO2 – Plant Efficiency Improvement Assessment

(I) PROJECT REPORT

B&V Project Number 147591
B&V File Number 10.0000

July 2008

Black & Veatch Corporation
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Overland Park, Kansas 66211
Tel: (913) 458-2000 www.bv.com



BLACK & VEATCH
Building a world of difference.

Principal Investigators:

Phil Webster, Project Manager

Matt Wood, Project Technical Lead

Kelly Whittenberg, Project Engineer

Curtis Robinson, Project Engineer

Matt Oakes, Project Engineer

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Appendices

30 PLANNED AND IN-PROGRESS PROJECTS

18 PROJECT OPPORTUNITIES

38 PROJECTS REMAINING AFTER INITIAL SCREENING (BASED ON
CAPITAL COST/TON)

103 PROJECT OPPORTUNITIES

59 PROJECTS DELETED BEFORE SCREENING

SAMPLE PROJECT ASSESSMENT FORM

[illegible][illegible][illegible][illegible]

[REDACTED]

[illegible][illegible][illegible][illegible][illegible]

[illegible]

[illegible]

[illegible][illegible][illegible]

[REDACTED]

[REDACTED]		[REDACTED]		[REDACTED]		[REDACTED]	
[REDACTED]		[REDACTED]		[REDACTED]		[REDACTED]	
[REDACTED]		[REDACTED]		[REDACTED]		[REDACTED]	
[REDACTED]		[REDACTED]		[REDACTED]		[REDACTED]	
[REDACTED]		[REDACTED]		[REDACTED]		[REDACTED]	
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[REDACTED]		[REDACTED]		[REDACTED]		[REDACTED]	
[REDACTED]		[REDACTED]		[REDACTED]		[REDACTED]	
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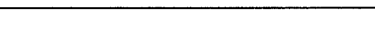
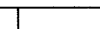
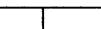
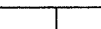
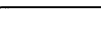
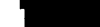
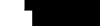
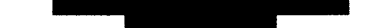
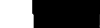
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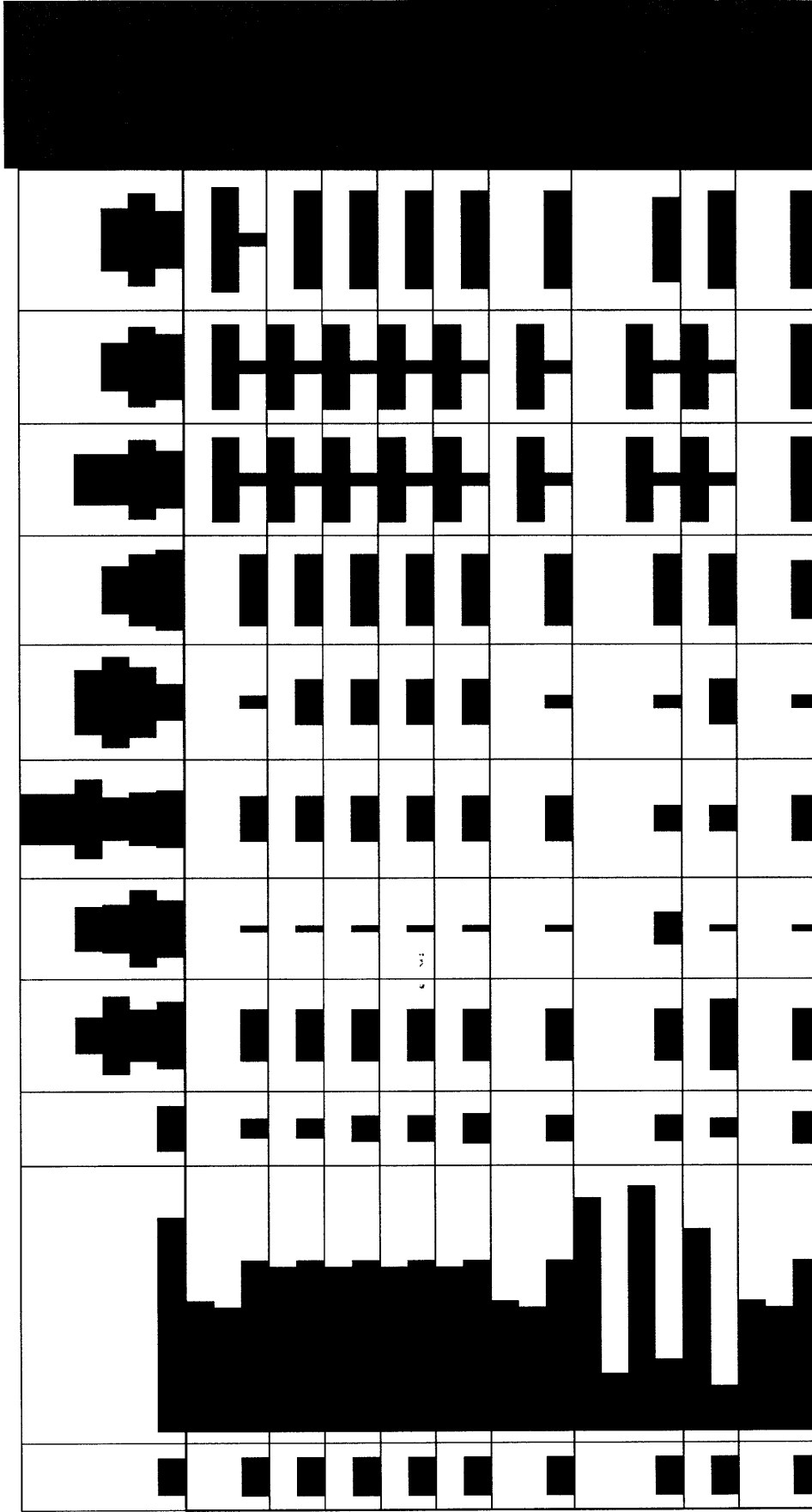
					
					
					
					

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Black & Veatch

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Kansas City Power & Light CO₂ – Plant Efficiency Improvement Assessment

Appendix B

[illegible]

[REDACTED]

[illegible]

A black and white photograph of a grid of 100 squares, arranged in 10 rows and 10 columns. The squares are filled with various patterns of black and white, creating a complex, abstract design. The patterns vary significantly from square to square, including solid black, solid white, and various geometric shapes and lines. The overall effect is a dense, textured composition.

Appendix D

28 July 2008	D-3	Black & Veatch
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Appendix D

Black & Veatch

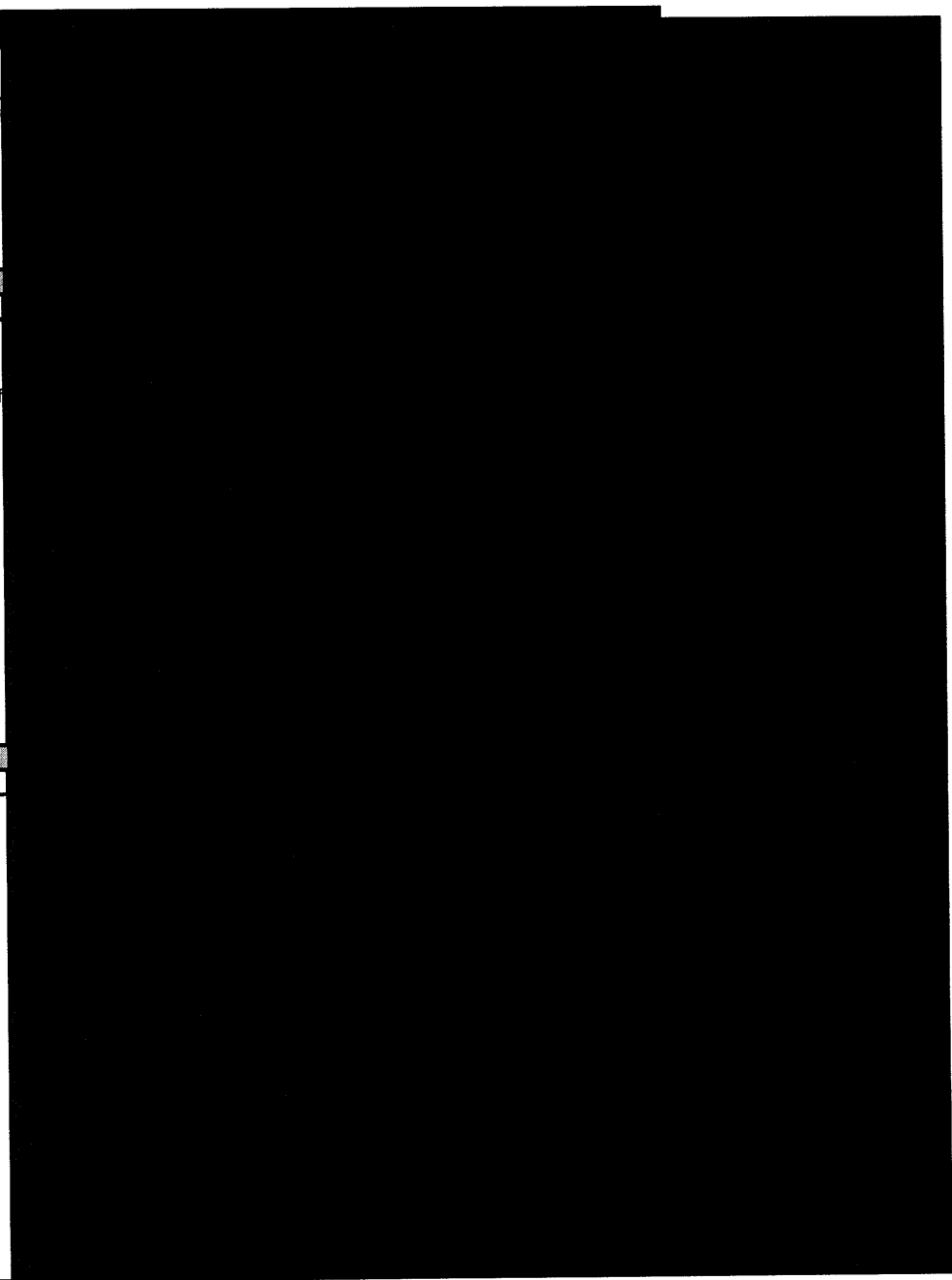
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Kansas City Power & Light
CO2 – Plant Efficiency Improvement Assessment

Ka Plant: B&V Project Number Project Title: Names	
Project Description	
General Description of Project	
Concerns	
Capital Cost	
Other (describe)	
Potential Impact	
Heat Rate Impact	
Reliability	
Operating Costs	
Maintenance Costs	
Aux Power	