# SO<sub>3</sub> Mitigation Study for

Ghent 1, 3, & 4

Mill Creek 3 & 4

**Trimble County 1** 

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March 29, 2006

LG&E/KU

FINAL REPORT SL-008736 – Revision 2 SO<sub>3</sub> Mitigation Study Ghent 1,3&4, Mill Creek 3&4, and Trimble County 1

Pam Orlando, PE Senior Mechanical Engineer II Generation Services Kentucky Utilities Company One Quality Street Lexington, Kentucky 40507

Dear Ms. Orlando:

Attached, for your use, is Sargent & Lundy's FINAL SO<sub>3</sub> Mitigation Study Report for Ghent – Units 1,3&4, Mill Creek – Units 3&4, and Trimble County – Unit 1, Rev. 2. We have revised the report to include an additional table per your comments. There were no revisions made to any of the report attachments, therefore I am not re-sending them.

Please contact me at (312) 269-6672 if you have any questions regarding this work. We appreciate this opportunity to provide our services to LG&E/KU.

Yours very truly, Stere M. Katzberger

Steve M. Katzberger Study Manager

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# SO<sub>3</sub> Mitigation Study – Ghent – Units 1, 3&4, Mill Creek – Units 3&4, and Trimble County – Unit 1

Prepared for:

Louisville Gas & Electric Company/Kentucky Utilities Company

Subsidiaries of:



REPORT SL-008736 March 29, 2006



55 East Monroe Street Chicago, IL 60603-5780 United States of America LG&E/KU SO<sub>3</sub> Mitigation Study

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Report SL-008736 Project No. 10584-022 March 29, 2006

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# 1. INTRODUCTION

#### 1.1 BACKGROUND

Louisville Gas & Electric/Kentucky Utilities (LG&E/KU) authorized Sargent & Lundy<sup>LLC</sup> to prepare a study for the mitigation of sulfur trioxide (SO<sub>3</sub>) at Ghent 1,3&4, Mill Creek 3&4, and Trimble County 1. Ghent Power Plant includes four pulverized coal units. Units 1,3&4 are each rated at 511 MW<sub>net</sub>. An FGD system is currently being installed for Unit 3, with future FGD installations for Units 1&4 in the planning stages. The existing FGD system on Unit 1 will be switched to serve Unit 2. Units 1,3&4 each have SCR systems installed and operating. Ghent — Unit 2, which does not have an SCR or FGD system, was excluded from the study. Mill Creek Power Plant includes four pulverized coal units. Unit 3 is rated at 386 MW<sub>net</sub>, while Unit 4 is rated at 490 MW<sub>net</sub>. Both units currently have FGD systems and SCR systems installed and operating. Trimble County Power Plant includes one pulverized coal unit, with a future unit in the planning stages. Unit 1 is rated at 495 MW<sub>net</sub> and currently has FGD and SCR systems installed. The FGD systems will allow these units to burn high sulfur coal, while still meeting sulfur dioxide (SO<sub>2</sub>) emission limits. The high sulfur coal, combined with the recently installed Selective Catalytic Reduction (SCR) systems, will produce higher levels of sulfur trioxide. While the SCR systems are currently operated during the ozone season (May-November), they will be required to operate year round starting in 2009.

Ghent 3&4 are equipped with hot-side electrostatic precipitators (ESPs). The other units all have cold-side ESPs. The hot-side ESPs potentially limit the sorbent injection options for Ghent 3&4 to injection in the furnace or upstream of the ESP. However, there are emerging strategies, such as hydrated lime injection downstream of a hot-side ESP with collection of reaction products and excess sorbent in the FGD system. These methodologies are unproven and the results of testing are as yet unpublished.

The SO<sub>3</sub>, combined with moisture in the flue gas, produces sub-micron size sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) particles, which cause higher visible opacity. The sulfuric acid aerosol particles cause increased corrosion of the air preheater, electrostatic precipitator and the flue gas and combustion air ductwork downstream of the air preheater. They also produce a denser, more visible, more persistent plume which may have a blue color

(blue plume) or orange-brown color depending on sky conditions. The sulfuric acid particles may also increase the tendency of the plume to touch down near the plant.

For this study, S&L investigated currently available SO<sub>3</sub> control technologies and their potential application at each unit. Station staff provided plant conditions (flue gas flow rates, coal firing rates, SCR design parameters, ESP design parameters, flue gas temperatures, coal analyses, etc.). This study combines a review of the technical feasibility of each technology with estimated capital costs of the feasible alternatives to provide technical and cost data which LG&E/KU can use to evaluate life cycle cost and select the most cost-effective SO<sub>3</sub> mitigation technologies for each unit.

# 1.2 SO<sub>3</sub> FORMATION

The oxidation of SO<sub>2</sub> to SO<sub>3</sub> occurs in two phases: 1) homogeneous gas phase reaction with oxygen radicals in the furnace, and 2) heterogeneous reaction with oxygen aided by the SCR catalyst. Higher sulfur coals produce more SO<sub>2</sub> and consequently higher SO<sub>3</sub> than low-to-medium sulfur coals. During combustion, a small percentage (~1-1.4% for the LG&E/KU units) of the SO<sub>2</sub> produced during combustion reacts further with oxygen radicals to form SO<sub>3</sub> in the furnace. Additional SO<sub>3</sub> is produced when SO<sub>2</sub> is oxidized by the catalyst in the SCR. The rate of oxidation of SO<sub>2</sub> to SO<sub>3</sub> is guaranteed by the catalyst supplier. The total oxidation by the SCR catalyst increases as additional catalyst layers are added. LG&E/KU's SCR catalysts have relatively high oxidation rates.

Virtually all of the sulfur trioxide gas combines with available water vapor in the flue gas to create both vapor-phase and condensed sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) as the flue gas is cooled in the air preheater. At high SO<sub>3</sub> levels in the flue gas, significant amounts of H<sub>2</sub>SO<sub>4</sub> can condense in the air preheater. The quantity of visible sulfuric acid droplets, which increase opacity, is dependent on both the acid dew point temperature and the concentration of H<sub>2</sub>SO<sub>4</sub> in the flue gas. Relatively high concentrations of sulfuric acid in the flue gas from the air preheater to the stack may also cause corrosion, fouling, and plugging, all of which may require changes in operation or additional equipment to reduce the sulfuric acid concentration to a tolerable level. The rapid quenching of flue gas temperature in the FGD system forms sub-micron aerosol H<sub>2</sub>SO<sub>4</sub> particles that are difficult to capture in the FGD system. In addition to increased equipment degradation,

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condensed sulfuric acid particles increase opacity and can create a visible blue or orange-brown plume upon leaving the stack.

# 2. DESIGN BASIS

#### 2.1 DESIGN PARAMETERS

A design basis was established jointly between S&L, LG&E/KU and station personnel for the SO<sub>3</sub> mitigation study. Information provided by LG&E/KU indicated expected SO<sub>3</sub> concentrations leaving the existing air preheaters of 46-69 ppmdv and leaving the FGD systems (existing and planned) at 31-51 ppmdv. The target SO<sub>3</sub> concentration at the stack exit was set at 5 ppm, which is the recommended level for low stack opacity (no visible plume). Below 5 ppm SO<sub>3</sub>, the existing cold-side ESPs may exhibit performance degradation. The study basis includes a 1% conversion of SO<sub>2</sub> to SO<sub>3</sub> in the furnace (1.39% for Trimble County - Unit 1) and another 1.2% (2 layers) to 2.1% (3 layers) conversion in the SCR catalyst. Approximately 30-40% reduction of SO<sub>3</sub> across the air preheater for units with cold-side ESPs, depending on the air heater exit temperature, and 10% for units with hot-side ESPs, 25% reduction of SO<sub>3</sub> in the FGD system and a 5 ppm reduction of SO<sub>3</sub> in the existing electrostatic precipitators. The sorbent injection technologies typically take credit for any SO3 reduction occurring in the air preheater (for upstream injection) and the electrostatic precipitator. The study is based on year round operation of the SCR and the SO<sub>3</sub> mitigation technology. The design basis included ambient conditions, current and future coal and flyash analyses, heat balance information (heat rate, coal firing rate, heat input, etc.), design conditions (temperature and pressures), catalyst oxidation rates and other pertinent data as shown in Table 2.1. The majority of design basis data was obtained from the recent SCR program design data.

Table 2.1: Design Parameters

	Heat Input to Boiler, MBtu/hr	SO <sub>2</sub> Inlet, lb/MBtu
Ghent 1	5,132	6.25
Ghent 3	5,132	6.25
Ghent 4	5,132	6.25
Mill Creek 3	4,175	6.80
Mill Creek 4	4,857	6.80
Trimble County 1	5,172	5.55

SO <sub>3</sub> in-furnace conversion - %	1.00	All xc TC1
SO <sub>3</sub> in-furnace conversion - %	1.39	%, Trimble County 1
Catalyst SO <sub>2</sub> to SO <sub>3</sub> Oxidation, %	1.90	Ghent 1
Catalyst SO <sub>2</sub> to SO <sub>3</sub> Oxidation, %	1.50	Ghent 3
Catalyst SO <sub>2</sub> to SO <sub>3</sub> Oxidation, %	1.50	Ghent 4

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Catalyst SO <sub>2</sub> to SO <sub>3</sub> Oxidation, %	1.40	Mill Creek 3
Catalyst SO <sub>2</sub> to SO <sub>3</sub> Oxidation, %	1.20	Mill Creek 4
Catalyst SO <sub>2</sub> to SO <sub>3</sub> Oxidation, %	2.10	Trimble County 1
ESP SO <sub>3</sub> reduction, ppm	5.00	All Units
Air Heater SO <sub>3</sub> reduction, %	30	Ghent 1 and Trimble
All Heater 503 reduction, 70	50	County 1
Air Heater SO <sub>3</sub> reduction, %	10	Ghent 3&4
Air Heater SO <sub>3</sub> reduction, %	40	Mill Creek 3&4
FGD SO <sub>3</sub> reduction, %	25	All units



Table 2.1: Design Parameters (Continued)

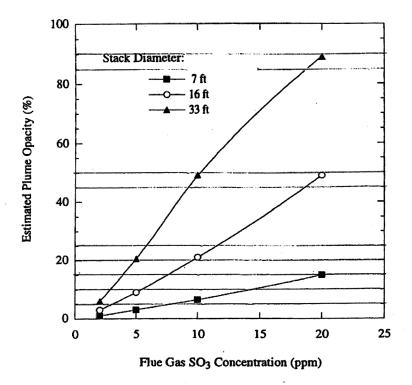
	Units	Ghent 1	Ghent 3	Ghent 4	Mill Creek 3	Mill Creek 4	Trimble County 1
Unit Size	MW <sub>net</sub>	511	511	511	386	490	495
Gas Flow							
Economizer Outlet	lb/hr (wet)	5,500,005	5,400,570	5,400,570	4,286,387	4,998,217	5,133,120
Air Heater Outlet	lb/hr	5,900,104	6,085,092	6,085,092	4,848,383	5,639,781	5,435,000
SO <sub>2</sub> to SO <sub>3</sub> Conv.							
Furnace	%	1.00	1.00	1.00	1.00	1.00	1.39
SCR Catalyst	%	1.90	1.50	1.50	1.40	1.20	2.10
SO <sub>3</sub> Concentration		:					
Document Cartes	lb/hr	401	401	401	355	413	499
Economizer Ouner	mdd	32.0	32.0	32.0	34.8	34.8	39.5
1-1 dO	lb/hr	401	338	338	355	413	499
SCK Inlet	mdd	32.0	27.0	27.0	34.8	34.8	39.5
10 a Ca	lb/hr	1,163	940	940	852	806	1,252
SCK Outlet	mdd	92.8	75.0	75.0	83.6	9.92	99.2
11. 11. O 12. 0 1	lb/hr	814	846	846	511	545	877
Air neater Outlet	mdd	65.0	67.5	67.5	50.1	46.0	69.4
100 Inlo	lb/hr	751	846	846	460	486	813
rod met	mdd	0.09	67.5	67.5	45.1	41.0	64.4
- F-C GC-	lb/hr	563	634	634	345	364	610
rod Outlet	mdd	45.0	50.6	50.6	33.9	30.7	48.3
Sorbent							
Ammonia							
Stoich. Ratio	1.25:1						
Feed rate	lb/hr	194	202	202	118	124	351
10-day Tank Size	ft (1:1.2)	11.3	11.5	11.5	9.6	9.7	13.8
Hydrated Lime							
Stoich. Ratio	10:1						
Feed rate	lb/hr	6,765	7,060	7,060	4,104	4,315	12,240
10-day Silo Size	ft (1:4)	15.8	16.1	16.1	13.4	13.6	19.3

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	Units	Ghent 1	Ghent 3	Ghent 4	Mill Creek 3	Mill Creek 4	Trimble County 1
Mag. Hydroxide (Blr.)							
Stoich. Ratio	7:1						
Feed rate	lb/hr	3,726	3,888	3,888	2,260	2,377	6,741
10-day Tank Size	ft (1:1.2)	22.6	22.9	22.9	19.1	19.4	27.5
Sec. Containment.	ft. x ft.	$41.4 \times 5.5$	42.3 x 5.5	42.3 x 5.5	32.3 x 5.5	33.1 x 5.5	43.1 x 5.5
Mag. Oxide							
Stoich. Ratio	7:1						
Feed rate	lb/hr	2,575	2,688	2,688	1,562	1,643	4,660
10-day Silo Size	ft (1:4)	6.6	10.1	10.1	8.4	8.5	12.1
Micronized Limestone							
Stoich. Ratio	7:1						
Feed rate	lb/hr	6,397	9,676	9,676	3,881	4,081	11,575
10-day Silo Size	ft (1:4)	15.0	15.2	15.2	12.7	12.9	18.3
Sodium Bisulfite							
Stoich. Ratio	2:1						
Feed rate	lb/hr	1,901	1,984	1,984	1,153	1,213	3,439
10-day Tank Size	ft (1:1.2)	20.1	20.4	20.4	17	17.3	24.5
Sec. Containment.	ft. x ft.	29.6 x 5.5	30.2 x 5.5	30.2 x 5.5	23.0 x 5.5	23.6 x 5.5	30.8 x 5.5
Trona							
Stoich. Ratio	3:1						
Feed rate	lb/hr	6,190	6,460	6,460	3,755	3,949	11,200
10-day Silo Size	ft (1:4)	16.0	16.3	16.3	13.6	13.8	19.6
Soda Ash							
Stoich. Ratio	1:1						
Feed rate	lb/hr	896	1,010	1,010	587	617	1,751
10-day Tank Size	ft (1:1.2)	15.2	15.4	15.4	12.8	13.1	18.5
Sec. Containment.	ft. x ft.	21.1 x 5.5	21.6 x 5.5	21.6 x 5.5	16.4 x 5.5	16.9 x 5.5	$22.0 \times 5.5$

Secondary containment is required for all tanks; dimensions shown are length of the side of a square by the depth of the liquid. Wall heights are six (6) inches greater than the specified depth.

For the purposes of this study, the  $SO_3/H_2SO_4$  in the flue gas will need to be reduced to 5 ppm or less to mitigate the "blue" plume phenomenon. Although limited data exists on the relationship between  $SO_3/H_2SO_4$  concentration and plume visibility, a level of 5 ppm was selected, as it would eliminate the visible plume under most atmospheric conditions. Additional published data indicates that below 5 ppm  $H_2SO_4$  in the flue gas, cold-side ESP performance may degrade. EPRI published a technical report, which includes a graph of the  $H_2SO_4$  concentration in flue gas versus predicted opacity. The graph is reproduced here:



Source: EPRI SO<sub>3</sub> Mitigation Guide (TR-104424)

# 3. TECHNICAL DESCRIPTIONS

#### 3.1 INTRODUCTION

The following are technical descriptions of the SO<sub>3</sub> mitigation technologies studied for use at Ghent – Units 1,3&4, Mill Creek – Units 3&4 and Trimble County – Unit 1. Four types of SO<sub>3</sub> mitigation technology options were considered:

- Alkaline additives on the coal belt
- Wet or dry sorbent injection
- Wet electrostatic precipitators (ESP)
- Switching to a low SO<sub>2</sub>-to-SO<sub>3</sub> conversion SCR catalyst

The basic premise of the alkaline additive and sorbent injection options is to either condense the  $SO_3/H_2SO_4$  on to the sorbent particles and flyash and collect it in the existing dry ESP or convert the  $SO_3/H_2SO_4$  into a salt and collect the salts in the dry ESP. A wet ESP placed after the existing or proposed wet flue gas desulfurization (FGD) system collects acid mist and much of the remaining solid particles. A replacement low conversion rate catalyst used in the SCR will convert a smaller percentage of the  $SO_2$  to  $SO_3$  with the goal of staying under the visible plume threshold. Some  $SO_3$  is normally condensed in the air preheater, on the fly ash in the precipitator and in the wet FGD system

# 3.2 ALKALINE ADDITIVES ON THE COAL BELT

Low sulfur coals with alkaline ash neutralize more  $SO_3$  than coals with acidic ash. The  $SO_3$  reacts with the alkaline components in the fly ash forming sulfates, which are then captured in the electrostatic precipitator (ESP). The use of alkaline additives on the coal belt introduces additional alkaline material in the furnace that then reacts with  $SO_3$ . Various alkaline materials including lime, limestone, dolomite, magnesium carbonate and proprietary products such as OmniClear<sup>TM</sup> from Omni Materials, Inc., may be added on the coal belt as it goes to the coal silos. OmniClear<sup>TM</sup> was tested at Cinergy's Gibson station.

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The calcium-based materials are more likely to form hard deposits and have a negative impact on ESP

performance. Calcium compounds have a co-benefit in tying up vapor-phase arsenic, which is a known

catalyst poison. Magnesium-based materials are generally more effective at capturing SO3 and form more

friable, water-soluble deposits. Sodium and potassium compounds are catalyst poisons, so they are not used

upstream of the catalyst.

The calcium- and magnesium-based alkaline materials are either added on the coal belt or pneumatically

injected into the furnace through idle burners. The stoichiometries required can be as high as 30 to 40:1.

Adding alkaline materials to the coal belt is a low capital cost option, which uses the coal mills to grind the

sorbent to a fine powder. All of these materials mainly capture furnace-generated SO3 and are not effective

at capturing SCR-generated SO3. In addition, alkaline additives may also modify the slagging and fouling

tendencies of the coal ash and in some cases have produced unacceptable increases in slagging, increased

LOI (burner injection) and increased furnace exit gas temperature. Higher furnace exit gas temperature

increases the SCR catalyst activity, which increases the SO<sub>2</sub> to SO<sub>3</sub> conversion rate. For the above reasons,

coal belt additives will not be considered in this study.

3.3 SORBENT INJECTION

Another method of SO<sub>3</sub> mitigation is sorbent injection. There are a variety of sorbents that can be added at

various points in the flue gas path to remove SO<sub>3</sub> and reduce or eliminate the visible plume from the stack.

The following sorbent injection technologies were considered in the study:

• Ammonia

Humidification Water

Hydrated Lime

Magnesium Hydroxide

Magnesium Oxide

• Micronized Limestone

Sodium Bisulfite (SBS)

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- Soda Ash
- Trona

All sorbent injection technologies, except furnace-injected Magnesium Hydroxide will be limited at Ghent Units 3&4 due to the existing hot-side ESPs, which are located upstream of the SCR. Injection of sorbents downstream of the ESPs adds particulate to the flue gas with only the wet FGD system remaining to capture the dust. As such, the quantity of sorbent which can be injected is limited by the FGD system's ability to collect particulate and remain in compliance with the particulate emission limit.

#### 3.3.1 Ammonia

Ammonia injection into the flue gas upstream of the ESP will reduce SO<sub>3</sub>, forming ammonia salts, mainly ammonium sulfate [(NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>] and ammonium bisulfate [NH<sub>4</sub>HSO<sub>4</sub>], depending on the reagent stoichiometric ratio applied. If the stoichiometric ratio of NH<sub>3</sub> to SO<sub>3</sub> is below one, the salts formed will generally be NH<sub>4</sub>HSO<sub>4</sub>, which is a sticky material known to cause air preheater and ESP fouling and plugging. The SCR systems can also cause this type of fouling, which is controlled by limiting ammonia slip to less than 2 ppm. Ammonia injection for SO<sub>3</sub> mitigation at stoichiometric ratios of between one and two tend to form predominantly (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> particles, which are not sticky and are collected in the ESP. Ammonia injection (at higher stoichiometries) upstream of the air preheater has a co-benefit of reducing air preheater fouling and the frequency and duration of air preheater washing.

The ammonia would be injected as an air/ammonia vapor mixture through a grid of nozzles in the ductwork entering or exiting the air preheater. Ammonia injection rates at NH<sub>3</sub>:SO<sub>3</sub> molar ratios of 1.5:1 to 2.0:1 can theoretically achieve SO<sub>3</sub> reduction of 90% to 95%. The primary drawback of this technology is that if ammonia in the flyash or gypsum exceeds threshold values, neither may meet salability/reusability quality requirements. In addition, off-gassing of ammonia from the flyash can become a nuisance in the ash handling and disposal operations as the human nose can detect ammonia at levels as low as 5 ppm. If the levels of  $SO_3/H_2SO_4$  being removed are too large ( $\geq$ 30 ppmv), then additional treatment may be required to reduce ammonia and decrease pH in the holding ponds where the flyash is disposed. Short term use of ammonia injection at plants with wet ash ponds could be investigated. The detrimental effects on the ash

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pond depend on the rate and duration of ammonia feed, the volume of the ash pond and the starting chemistry of the ash pond. Acid addition could be used to control pH in the ash pond. This type of evaluation is beyond the scope of the present study.

This particular SO<sub>3</sub> mitigation technique is most practical where an existing SCR is in operation (NH<sub>3</sub> is already on-site), where the SO<sub>3</sub> concentration reduction required is under 30 ppmv, and the flyash is not sold, but rather is collected dry and landfilled. Ammonia alone may not be able to reduce the SO<sub>3</sub> concentration to the desired level at the stack exit without causing a nuisance for the plant ash handling and disposal operations. Ammonia injection is currently being used at AEP Cardinal - Units 1&2, but the units are currently burning a lower sulfur coal with no FGD. Ammonia alone is not a viable technology for reducing SO<sub>3</sub> from the levels estimated for the LG&E/KU sites to 5 ppmdv, or less, at the stack exit due to the attendant side effects. At typical injection stoichiometries of 1.25:1, ammonia is capable of reducing 70% of SO<sub>3</sub> emissions at the stack, which is insufficient for the cases investigated in this study. The ammonia injection option will not be developed further in this study.

### 3.3.2 Humidification Water

Humidifying the flue gas upstream of the SCR or upstream of the air preheater with water injection can reduce SO<sub>3</sub> as follows: 1) injection upstream of the SCR reduces flue gas temperature entering the SCR and lowers the oxidation rate of the catalyst, or 2) injection upstream of the air preheater can lower the flue gas temperature below the acid dew point. This causes the sulfuric acid to condense on the sorbent particles (if used with sorbent injection) and flyash particles that can then be collected in the ESP or further downstream in the FGD system. The sorbent and flyash particles present in the flue gas provide surface area on which the sulfuric acid condenses. The sub-five micron sized particles provide a large surface area for sulfuric acid condensation.

Water injection upstream of the SCR may cause flyash to drop out in the ductwork or plug the catalyst and if not carefully controlled, at low loads, liquid water may damage the catalyst. Humidification upstream of the air preheater can cause corrosion or plugging of the air preheater and the downstream equipment due to

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increased condensed sulfuric acid. Water injection upstream of the catalyst was tested at AEP Gavin Station, but discontinued due to flyash dropout in the ductwork. Humidification upstream of the electrostatic precipitator was tested by EPRI at the ECTC, but no results were reported. To date, no stations are using humidification water for SO<sub>3</sub> mitigation. Water injection alone will not reduce the SO<sub>3</sub> concentration enough to meet the desired SO<sub>3</sub> levels at the stack exit, with an expected maximum SO<sub>3</sub> reduction capability of 30%. Humidification was not considered in this study.

#### 3.3.3 Hydrated Lime

Hydrated lime (Ca(OH)<sub>2</sub>), injected pneumatically as a dry powder into the flue gas ductwork upstream of the existing cold-side, dry ESP, will react with SO<sub>3</sub> vapor and condensed sulfuric acid to form calcium sulfate salts that can be removed by the ESP. Injection rates vary between 1 lb/hr per 1,000 acfm with humidification to 2 lb/hr per 1,000 acfm without humidification to achieve 80%-85% reduction and as much as 5.6 lb/hr per 1,000 acfm for 95% reduction. This study used a sorbent injection molar ratio of 10:1 for 90% SO<sub>3</sub> reduction using a typical hydrated lime. Specially prepared hydrated limes having increased porosity may have lower stoichiometries. This option has certain drawbacks as the by-products increase fly ash resistivity, it requires a high stoichiometric ratio, and it needs long duct runs for reagent mixing. This option was used at AEP Gavin, but the maximum lime injection quantities (~2.5 tph) were limited by ESP performance.

Hydrated lime has high surface area per unit volume for better reaction with  $SO_3$ . However, hydrated limes vary greatly in surface area based on the characteristics of the limestone used to make the lime and the methods used to pressure hydrate the lime. Chemical Lime Company is now offering a specially prepared hydrated lime, called Sorbacal  $H^{\text{TM}}$ , which has very high surface area and excellent reactivity with  $SO_3$ . The cost of this product is also higher than a typical hydrated lime.

The use of a typical hydrated lime also exhibits some of the highest stoichiometric ratios required to achieve the desired removal, relative to other sorbents. Finally, because hydrated lime injection occurs after the air preheater, none of the potential air preheater corrosion issues would be eliminated. However, this would eliminate possible plugging of the air preheater caused by sulfate salts. Barring ESP limitations,

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hydrated lime, alone, should be capable of reducing SO<sub>3</sub> to acceptable levels at the Mill Creek and Trimble County stations as well as Ghent Unit 1.

Injection of hydrated lime upstream of the wet FGD system at units with hot-side ESPs, such as Ghent 3&4, depends on capture of the added dust and reaction products in the wet FGD. This is reported to be used at Cinergy's East Bend – Unit 2. A wet FGD system has a limited capability for collection of particulate so the amount of hydrated lime injected would also be limited to avoid exceeding the particulate emission limit.

# 3.3.4 Magnesium Hydroxide

Magnesium hydroxide (Mg(OH)2) is a magnesium compound injected as a slurry into the upper furnace for SO<sub>3</sub> control. Mg(OH)<sub>2</sub> loses its water of hydration in the furnace to become MgO that reacts with SO<sub>3</sub> to form magnesium sulfate which is collected by the dry ESP. This is a proven technology for SO<sub>3</sub> mitigation on oil-fired units, with the first full-scale installation over 30 years ago. Due to the injection location in the furnace, Mg(OH)<sub>2</sub> is most effective at reducing furnace-generated SO<sub>3</sub>. It is less effective at reducing SO<sub>3</sub> emissions resulting from SCR oxidation. Alkali addition in the furnace also limits the amount of corrosion and other negative effects associated with having higher quantities of SO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub> in the system. Mg(OH)<sub>2</sub> is injected at Mg:SO<sub>3</sub> molar ratios of 4.5:1 based on the furnace outlet SO<sub>3</sub> concentration to achieve 90% reduction of furnace-generated SO<sub>3</sub>. High ash resistivity may be a problem at high injection rates. Typically, this method of SO<sub>3</sub> removal is effective up to the range of 40% - 80% overall. A stoichiometry of 7:1 would be required to achieve 90% overall reduction of both furnace and SCR generated SO3. The SO<sub>3</sub> mitigation efficiency is sensitive to the location and elevation of the injection into the boiler. Magnesium Hydroxide has been used at Bruce Mansfield 3, Gavin 1 and at Zimmer. Due to the high SO2 concentration in the flue gas and the guaranteed conversion rate of the catalyst, it is unlikely that magnesium hydroxide injection into the furnace, alone, will reduce SO<sub>3</sub> to the desired concentrations at the stack outlet. Magnesium hydroxide may be a viable choice for Ghent - Units 3&4, the units equipped with hot-side ESPs.

#### 3.3.5 Magnesium Oxide

Magnesium oxide (MgO) is pneumatically injected as a dry powder upstream of the air preheater, reacting with the SO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub> to create magnesium sulfate salts that are then collected by the cold-side ESP. Magnesium oxide has been tested at only a few power plants, although one supplier does cite examples of up to 80% removal at approximately a 7:1 stoichiometric ratio. High ash resistivity could be a problem for these salts, as this same problem is seen with the Mg(OH)<sub>2</sub> injection in the boiler when attempting high SO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub> removal efficiencies. The use of MgO injection alone for SO<sub>3</sub> mitigation may be limited by resistivity impacts on the ESP. MgO was not considered further in this study.

#### 3.3.6 Micronized Limestone

Marsulex markets a technology called CleanStack™, which uses micronized limestone. The micronized limestone particles injected upstream of the air preheater, serve the dual purpose of reacting with the SO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub> to form calcium salts and providing additional surface area on which the acid mist can condense. This option would require modifications to the air preheater to lower the flue gas outlet temperature below the sulfuric acid dew point. The reacted and condensed upon particles are collected by the dry ESP and removed from the system. The major benefit of using micronized limestone is the lower sorbent cost of limestone compared to lime, magnesium compounds or sodium compounds. A co-benefit of lowering the air preheater exit temperature is an improvement in unit heat rate. Micronized limestone has resistivity limitations similar to that of lime as both produce calcium sulfate reaction products which will increase flyash resistivity. Micronized limestone depends on small particle size to create surface area where hydrated lime has high porosity as well as small particle size.

There is no field experience with micronized limestone for SO<sub>3</sub> mitigation. A demonstration system is being installed at Dominion Energy's Chesterfield – Unit 5 for start-up in the first quarter of 2006. This technology was modeled based on measured SO<sub>3</sub> data from a 315 MW unit. In addition to lowering the exit temperature of the air preheater to below the acid dewpoint, additional proprietary modifications to the air preheater must be performed including the installation of Alstom's ClearFlow<sup>™</sup> heat transfer elements. This includes converting the cold-end and intermediate layers of the air preheater to a combined cold-end

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layer, changing the profile of the cold-end elements, using enamel coated elements and removing some

element support grids. Due to the absence of a full scale demonstration of micronized limestone, it is

unknown whether this technology, used alone, or in conjunction with humidification water, will reduce SO<sub>3</sub>

concentrations to the desired levels. Expected SO<sub>3</sub> removal efficiencies for this technology are 70% based

upon injection stoichiometric ratios of 7:1. This option was not considered further in this study.

3.3.7 Sodium Bisulfite

Sodium Bisulfite (SBS) can be injected into the flue gas stream upstream or downstream of the air

preheater, or upstream of an FGD system as a 10 wt% solution using dual fluid atomizers. The SBS reacts

with the SO<sub>3</sub> present in the flue gas to form sodium salts, which are then collected by the existing dry ESP

or in the FGD system. SBS has been used at three commercial installations, First Energy's Bruce Mansfield

Station, Tennessee Valley Authority's (TVA) Widows Creek Unit 7, and Cinergy's Gibson Station as well

as in full-scale testing at Vectren Corporation's A. B. Brown Station and in one duct at AEP's Gavin Unit

1.

The full-scale testing indicates SO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub> removal capability down to approximately 2 ppm to 10 ppm

with reagent stoichiometry of 1.5:1 to 2.0:1. For this study, a sorbent injection molar ratio of 2.0 was used.

Air preheater fouling and dust dropout in the ductwork have been reported by the operating facilities.

Weekly cleaning of the dual fluid atomizers is required. The SBS is a byproduct of the double alkali

scrubber at Vectren's A. B. Brown Station. The SBS process is patented by URS/Codan Associates. An

annual licensing payment of \$200/MW/year has been included in the O&M costs associated with this

option. The byproduct SBS currently comes from a single source of supply although commercial sodium

sulfite or soda ash can be used in its place. Sodium sulfite is a more costly sorbent than SBS.

The sodium-based sorbents have no detrimental impact on cold-side ESPs. The lower stoichiometries of

sodium-based sorbents result in less total dust added than the calcium or magnesium sorbents and sodium is

an ESP conditioning agent.

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SBS could be injected upstream of the FGD systems at Ghent – Units 3&4 with the reaction products being collected in the scrubber. Because SBS has a lower stoichiometry than calcium and magnesium sorbents, the total dust load to the FGD would be smaller. Testing would be needed at Ghent to demonstrate the effectiveness of SBS injection upstream of the FGD before being permanently installed.

#### 3.3.8 Soda Ash

URS/Codan recently developed another means of producing SBS in-situ by injecting soda ash (Na<sub>2</sub>CO<sub>3</sub>) solution into the ductwork through dual fluid atomizers. Within the flue gas ductwork, the soda ash combines with SO<sub>2</sub> to produce SBS and sodium sulfite. Both of these products react with SO<sub>3</sub> molecules present to form sodium bisulfate. The dual sorbent process is installed at Cinergy's Gibson Units 1-5. Tests at the Gibson Station indicate 40%+ removal, with the SCR in service, at stoichiometric ratios of 1.5:1. This system has also been installed at Pennsylvania Power & Light's Montour Station, Units 1&2. Because either SBS or soda ash can be injected in this system, while still meeting desired outlet concentrations, this system is more flexible than many of the other sorbent injection systems. This process would also include an annual licensing fee of \$200/MW/year.

# 3.3.9 Trona

Sodium sesquicarbonate (Na<sub>2</sub>CO<sub>3</sub>•NaHCO<sub>3</sub>•2H<sub>2</sub>O) or "Trona" is a naturally occurring mineral which is commercially known as Solvair Select 200 (minus 200 mesh particle size) and is supplied as a powder that is pneumatically injected into the ductwork upstream of the air preheater through a grid of injection nozzles (Section 7.2.3). The Trona reacts with the SO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub> and creates sodium salts that are collected in the existing dry ESP. SO<sub>3</sub> reduction of up to 90% is achievable at molar ratios of 3.0:1. Trona is being used at AEP's Gavin Unit 1 and has been tested at AEP Zimmer with promising results. Trona has had no detrimental effects and may even have had a slight beneficial effect on the performance of the existing ESPs. Some drop out and accumulation of solids in the ductwork has occurred at Gavin. The solids deposits are friable, so soot blowers or acoustic horns may be needed to break up and re-entrain these deposits. Trona is mined in the Green River, Wyoming area and would be shipped by rail to the site or to a central point in the Louisville area where the Trona could be transferred from rail to truck for delivery to

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the sites. Trimble County has no rail capability. A shortage of locomotives was reported to be a problem in obtaining shipments of Trona to the Zimmer site. While there are several companies mining Trona from the Green River area to produce soda ash, only one (Solvay Chemicals) currently produces Trona with the required particle size needed for SO<sub>3</sub> capture.

If Trona is selected for use at multiple LG&E/KU sites, a central rail delivery point could be considered for long term storage with truck distribution to each site. The study did not include the cost of a central storage and transfer facility. AEP has applied for a patent on this process, so a licensing fee may also be required.

Preliminary testing has been conducted at Mirant's Potomac River Station to test the effectiveness of Trona injected upstream of the hot-side precipitator. These tests, whose results were published in January 2006, were done to test the removal of SO<sub>2</sub> and did not include measures to test SO<sub>3</sub> removal. Additionally, the Potomac River Station does not currently have an SCR installed and is running a dry stack. Future testing is planned and will include testing for SO<sub>3</sub> removal.

#### 3.4 WET ELECTROSTATIC PRECIPTATOR (ESP)

A wet ESP is typically installed between the FGD absorber and the stack, removing most of the remaining flyash as well as the condensed sulfuric acid. The wet ESP may be supported independently from grade for horizontal gas flow or mounted on the top of the absorber for vertical gas flow. The deciding factor on whether to use a horizontal or vertical flow lies in the tradeoff between the extra ductwork and footprint needed to install the wet ESP supported from grade and the structural and foundation alterations necessary to put the wet ESP on top of the FGD absorber. In either arrangement the wet ESP can very effectively capture sulfuric acid aerosols (90+%). Wet ESPs have been used for many years in the metallurgical and other non-utility industries, at the AES Deepwater cogeneration plant in Houston since 1986 and at Xcel Energy's Sherbourne County Station. A wet ESP was installed on top of an FGD absorber at New Brunswick Power's Coleson Cove and Dalhousie plants, started up in 2004, and Wisconsin Energy recently selected wet ESPs for their new plant, the 1,000 MW Elm Road project.

Wet ESPs operate in a three-step process that includes charging the entering particles, collection of the particles on oppositely charged plates, and cleaning the collection surfaces. While a dry ESP uses mechanical cleaning (rapping) of the collecting plates, a wet ESP uses either an intermittent or continuous water wash. The advantages of a wet ESP include an increased power level (2 W/acfm as opposed to 0.1 to 0.5 W/acfm with a dry ESP) and reduced particle re-entrainment because a wet ESP does not need rapping of the collecting plates. In addition to the auxiliary power used, the wet ESP uses clean water for washing the plates and may use MgO to neutralize the wash water for reuse or consume some of the FGD reagent (limestone) if drained to the FGD system. The wet ESP also has potential co-benefits in the collection of fine fly ash particles and particulate mercury. Wet ESPs require the use of costly acid-resistant materials of construction for ductwork and ESP internals. The vertical flow wet ESPs typically require more corrosion resistant materials than horizontal flow wet ESPs because they are washed intermittently rather than continuously. Ghent – Units 3&4 are good candidates for wet ESPs based on the limited applicability of sorbent injection alternatives since these units have existing hot-side ESPs.

# 3.4.1 Horizontal Flow - Wet ESP Supported from Grade

The horizontal flow wet ESP would be supported from grade between the FGD absorber and the stack. Additional ductwork is necessary between the FGD absorber and the wet ESP and again between the wet ESP and the stack. The horizontal flow wet ESP can be elevated above access roads, for example, to alleviate the larger footprint required, but the cost of support steel, foundations and piles would be higher. In the horizontal flow wet ESP, a conventional plate and wire configuration is used. The wastewater from the wet ESP can be added to an existing wastewater treatment system, treated with MgO and recycled or sent to the ash pond or added to the FGD reaction tank. The horizontal flow wet ESP takes considerable footprint area on site, which is limited at Ghent and Mill Creek. The horizontal flow wet ESP for each unit is 90% efficient, with 230,000 sq. ft. of collecting area, three fields in series, 12 transformers, horizontal inlet and horizontal outlet in a double deck arrangement. Ductwork from the top of the absorber is included. The ESP casing, roof, and sidewalls, inlet and outlet nozzles, collecting plate assemblies and water wash collection pans are constructed of A2205 stainless steel. External stiffeners and support steel are constructed of A572 grade 50 steel. Water spray nozzles are polypropylene plastic. Mill Creek – Units

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3&4 and Trimble County – Unit 1 are good candidates for a horizontal flow wet ESP. These units each have multiple FGD absorbers, so they are not easily equipped with vertical flow wet ESPs. Arrangement drawings are attached in Appendix 8. The layouts shown for Ghent – Units 1&4 horizontal wet ESPs included moving the location of the chimneys to make room for the wet ESP between the FGD and the chimney. Because the FGDs and chimneys have not been purchased yet, no costs were added for moving the chimneys.

# 3.4.2 Vertical Flow - Wet ESP on Absorber Tower

The vertical flow wet ESP would be built directly on top of the FGD absorber. It can be supported by the absorber structure (future Ghent – Units 1&4 FGD) or supported from a separate steel structure above the absorber (Ghent – Unit 3). In a vertical flow design, bundles of tubes would serve as the collection area while a wire running down the center of each tube would provide the necessary electrical discharge. The use of water in the wet ESP reduces particle re-entrainment and solves the limitation present in the dry ESP. Due to the rapid cooling and humidification of the flue gas in the FGD system, the remaining submicron H<sub>2</sub>SO<sub>4</sub> mist in the flue gas not captured by the FGD system is collected in the wet ESP. In addition to the sulfuric acid mist, the wet ESP can remove much of the flyash remaining in the flue gas as well as any scrubber carryover. One drawback to the system is that the liquid waste will be drained through collection troughs and piping to the FGD reaction tank, adding a small amount of acid that would require neutralization as well as a small quantity of trace metals and flyash, which may alter process chemistry.

Due to the extra weight of the system, the foundation and structural steel for the scrubber would have to be designed to carry this load as well as that of the scrubber. Also, the chimney would have to include a breeching opening at a higher elevation to accept the outlet duct from the wet ESP. The chimney liner would be about 60 feet shorter due to the higher breeching opening. However, this design also greatly reduces the quantity of ductwork required, as opposed to the horizontal flow design wet ESP. This process is simplified for Ghent Units 1&4 in that the FGD towers are not yet designed or constructed, so the wet ESP can be planned and engineered for from the beginning. For Ghent - Unit 3, the foundation for the absorber has been designed to support the load of a future WESP, but would require significant structural

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steel as the FGD tower was not designed to support the load. The cost of independent structural steel support, foundations and piles were included, as applicable. Arrangement drawings are attached in Appendix 8.

The vertical wet ESP for each unit is 90% efficient, with four chambers (each field is divided into four quadrants of the circular cross section casing) and three collection fields in series. Because the vertical wet ESP is washed intermittently rather than continuously like the horizontal wet ESP, the collecting electrodes will be constructed of C-276 for all fields. The discharge electrode frames, top suspension frames, lower alignment frames and wash water piping will be constructed of C-276 for the first field and 6% moly stainless steel for the remaining fields. The insulator compartments will be 304 stainless steel. The vertical wet ESP will be equipped with 12 transformer/rectifier sets each rated at 110kV peak and 1,250 mA. The cost of the vertical flow wet ESP is higher due to the use of C-276 for all three fields. If lesser alloys are used for fields two and three, the cost could be reduced.

# 3.5 LOW CONVERSION CATALYST

Another option for reducing the levels of SO<sub>3</sub> in the flue gas leaving the SCR is to change to a catalyst with a lower conversion (oxidation) rate of SO<sub>2</sub> to SO<sub>3</sub>. The catalyst could be replaced all at once or one layer at a time as part of the current catalyst management system. SO<sub>2</sub> oxidation increases with the Vanadium content of the catalyst and the operating temperature of the catalyst. Haldor-Topsoe, a catalyst supplier, also reports that the presence of iron in the fly ash increases the oxidation of SO<sub>2</sub> to SO<sub>3</sub>. In addition, other impurities in the catalyst can increase oxidation. The LG&E/KU SCRs have relatively high conversion rate catalysts, ranging from 1.2% to 2.1% with all catalyst layers installed.

The catalyst manufacturers have been developing low conversion rate catalysts. One supplier quoted rates as low as 0.2% with zero dust, but the conversion rate is highly temperature dependent. Haldor-Topsoe reports low conversion rates for their catalyst at Harrison (<0.3%), Cayuga (<0.5%) and at Elmer Smith (<0.3%).

The use of low conversion rate catalyst at Ghent – Units 3&4 is an option that must be considered because the hot-side ESPs preclude injecting large quantities of sorbent after the ESP. If Mg(OH)<sub>2</sub> were injected in the furnace to remove 90% of the furnace generated SO<sub>3</sub> and a 0.6% or less conversion rate catalyst was installed, SO<sub>3</sub> could be reduced to 5.6 to 8.5 ppm at the stack.

The low conversion catalyst is also a less active catalyst for NO<sub>X</sub> reduction. This means that more catalyst volume (~15%) may be needed, or the catalyst life may be shorter and a cost would be incurred for both the initial purchase and more frequent replacement cost. The low conversion catalyst is also not able to achieve the required outlet SO<sub>3</sub> concentration by itself since some SO<sub>3</sub> is generated in the boiler prior to the SCR. So, a sorbent injection system would be needed anyway. A low conversion catalyst used in conjunction with a sorbent injection technology may be the lowest cost option. The study did not estimate the cost of catalyst replacement because LG&E/KU has recent pricing for replacement catalyst.

# 3.6 COMBINATIONS OF SORBENT INJECTION TECHNOLOGIES

Several of the sorbent injection technologies have limitations such as fly ash resistivity which prevent a single approach to achieving the goal of reducing SO<sub>3</sub> from estimated levels to 5 ppm or less. As such, combinations of technologies should be considered to achieve the desired SO<sub>3</sub> reduction. For example, Mg(OH)<sub>2</sub> injection in the furnace combined with hydrated lime or Trona injection ahead of the cold-side ESP may also be considered. However, the use of combinations of technologies increases the capital costs for multiple storage and injection systems. In addition, on-site space limitations may preclude multiple storage and injection systems. A combination of Mg(OH)<sub>2</sub> injection in the furnace and replacement of the SCR catalyst with a low SO<sub>2</sub> to SO<sub>3</sub> conversion catalyst and SBS injection upstream of the FGD system could also be considered for Ghent – Units 3&4. A table is included below summarizing the technology combinations which are likely to reduce SO<sub>3</sub> emissions at the stack outlet to the desired levels.

Table 3.1 Summary of SO<sub>3</sub> Mitigation Technology Efficiencies

Mitigation Technolog	gy (Stoich. Ratio)	Expected SO <sub>3</sub> Reduction Percentage
Ammonia	1.25:1	70%
Humidification Water		27%
Hydrated Lime	10:1	90%



Mitigation Technology (Stoich. Ratio)	Expected SO <sub>3</sub> Reduction Percentage
Magnesium Hydroxide (Blr.) 7:1	90% (Boiler-generated SO <sub>3</sub> )/40-60% overall
Magnesium Oxide 7:1	80%
Micronized Limestone 7:1	70%
Sodium Bisulfite 2:1	90%
Soda Ash 1:1	90%
Trona 3:1	90%
Wet ESP	90%
Low Conversion Catalyst	28-43% for LG&E/KU Sites
Combinations of Technologies	
Sorb. Inj. (US of AH) + Low Conv. Catalyst	95%
Mag. Hydroxide + Sorb. Inj. (US of AH)	95%
Wet ESP + Sorb. Inj. (US of AH)	95%
Wet ESP + Mag. Hydroxide	95%
Wet ESP + Low Conversion Catalyst	95%

Unit	Required SO <sub>3</sub> Removal (%)
Ghent 1	90%
Ghent 3	90%
Ghent 4	90%
Mill Creek 3	87%
Mill Creek 4	85%
Trimble County 1	90%

# 4. RISK ASSESSMENT

The science and technology of SO<sub>3</sub> mitigation for power plants burning high sulfur coal equipped with SCR and wet FGD systems is currently evolving. Each of the technology options considered in this study has varying degrees of risk associated with it. The sorbent injection technologies can produce deposits in the ductwork, air preheater, and on turning vanes and internal struts and bracing. The dry sorbents typically produce dry deposits that should be controllable by soot blowers or acoustic horns. The wet sorbent technologies like SBS can produce harder deposits in both the air preheater and ductwork. Injection nozzles require regular inspection and cleaning. This adds a risk of increased maintenance, unplanned outages for cleaning and increased fan power. The low SO<sub>2</sub>-to-SO<sub>3</sub> conversion rate catalyst option includes the risk of shorter catalyst life and increased long term catalyst replacement costs.

The process scale-up risk applies mainly to the sorbent injection technologies. The key parameters that must be demonstrated in a full-scale application include: the ability to adequately distribute and mix the sorbent in the furnace or ductwork for contact with the SO<sub>3</sub>; the molar ratio of sorbent to SO<sub>3</sub> versus percent removal; undesireable side effects such as: dust dropout, buildup, air preheater plugging, ESP performance degradation, contamination of byproducts, increased furnace slagging and fouling, and regular maintenance of the injection nozzles; and the capital and O&M costs of the process at full scale. Some of the technologies have been demonstrated at full scale; others have not.

# 4.1 IMPACT ON ESP PERFORMANCE

A review of the existing ESPs and the original design parameters indicates that the concerns of increased fly ash resistivity and ESP performance degradation resulting from sorbent injection must be considered. The relative amount of sorbent added compared to the fly ash in the coal is very small. The existing ESPs were designed for much higher inlet grain loading than would result from any of the sorbent injection options. There will be adequate SO<sub>3</sub> in the flue gas to the ESPs to condition the ash and lower resistivity. SO<sub>3</sub> is a commonly used conditioning agent. There is a moderate risk associated with calcium-based sorbents, a lower risk with magnesium-based sorbents and very low risk with sodium-based sorbents. The

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greatest risk of ESP performance degradation is for those ESPs with the smallest specific collecting areas (SCA). Only Trimble County – Unit 1 has a relatively large SCA.

#### 4.2 IMPACTS OF SORBENTS ON FLY ASH SALABILITY

The calcium- and magnesium-based sorbents will have no significant impact on fly ash chemistry and its marketability. Sodium-based sorbents add water soluble sodium compounds to the fly ash, but not enough to affect its salability. Ammonia will definitely affect salability of the fly ash due to the ammonia odor imparted.

#### 4.3 IMPACTS ON GYPSUM SALABILITY

The calcium-based sorbents are compatible with a commercial grade gypsum product. The gypsum buyers have established limits on the minimum CaSO<sub>4</sub> content and maximum CaCO<sub>3</sub> and MgCO<sub>3</sub> in the product. Very large quantities of limestone or magnesium compounds could dilute the gypsum purity or exceed the limits set on CaCO<sub>3</sub> or MgCO<sub>3</sub>, but most of the sorbent will be captured by the existing ESP. Sodium and magnesium-based compounds are water soluble and will be washed out of the gypsum. Ammonia will be collected in the wet FGD system and appear in the gypsum. Some of the ammonia will be washed out of the gypsum, but if more than 5 ppm remains, salability will be negatively affected.

#### 4.4 SUMMARY OF POTENTIAL RISKS FOR EACH TECHNOLOGY

Ammonia: The potential revenue loss due to fly ash and gypsum salability, ammonium salt formation, byproduct reuse and disposal, landfill disposal, odor nuisance, and fly ash pond treatment costs are the major drawbacks of this technology. In addition to these drawbacks, this technology will only meet the target SO<sub>3</sub> reduction rate at very high injection rates.

<u>Humidification</u>: Humidification upstream of the SCR can produce ash deposits in the ductwork and could plug or damage the catalyst. There is a risk of increased maintenance cost and the cost of premature catalyst replacement. In addition, humidification alone will reduce SO<sub>3</sub> emissions by about 27%, which does not meet the target SO<sub>3</sub> reduction.

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Hydrated Lime: The data presented in the literature for this technology is old, and full scale results from any utility are not documented to serve as the basis for performance estimates. The dry sorbent storage and delivery system is subject to moisture, plugging and erosion problems. The effectiveness of the hydrated lime sorbent depends on high surface area, which varies between lime sources. Fly ash resistivity increases

may result in ESP performance degradation.

Magnesium Hydroxide: The sorbent is available as a commercial product and as a byproduct from the Thiosorbic™ Lime FGD system operation. The cost of the commercial product is significantly more than the byproduct material. There is currently a limited supply of the byproduct Mg(OH)<sub>2</sub>. The data presented in the literature for this technology is recent, and the full scale results from several plants are documented to serve as the basis for performance estimates. The furnace sorbent injection of Mg(OH)<sub>2</sub> could cause increased furnace and convection pass fouling. Fly ash resistivity increases may result in ESP performance

Magnesium Oxide: Since MgO is produced by a limited number of suppliers, the cost will be dependent on the delivery cost based on the transportation distance to the plant. The dry sorbent storage and delivery is subject to moisture, plugging and erosion problems. Magnesium oxide alone cannot achieve 90% SO<sub>3</sub> removal.

<u>Micronized Limestone</u>: This technology has not been pilot tested at any power plant, but the supplier is willing to share the cost with any utility who will allow them to install a slip stream pilot plant. There is a risk of fouling, scaling of byproduct in the ductwork, air preheater, and resistivity problems in the electrostatic precipitator. The cost of technology development and demonstrating the stoichiometry are added risks.

Sodium Bisulfite: In addition to the proprietary technology, single source of supply, the yearly licensing fee, and the reagent (sodium bisulfite powder) delivered cost, the major drawback of this technology is O&M cost. The cost of the project installed at Gibson Station increased significantly from start to finish. While byproduct SBS is a less costly sorbent, Vectren may not continue to produce the material.

degradation.

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Soda Ash: In addition to the proprietary technology, this sorbent injection technology requires longer duct

residence time due to the multiple reactions which need to take place and does not have the experience

level of SBS. Injection of soda ash upstream of the air preheater is not feasible for the LG&E/KU plants

due to residence time requirements.

Trona (Sodium sesquicarbonate): Trona is an expensive reagent with a long shipping distance from Green

River, Wyoming and has been limited by transportation availability at Zimmer Station. Typically shipped

by rail, the Trona would have to be transferred to trucks at a centrally located storage and transfer facility.

In addition, there is currently only one source of supply. AEP has applied for a patent for this technology,

so a licensing fee may apply.

Transportation and Fuel Cost Risks: All of the sorbents are subject to risks associated with transporting

material over varying distances as well as the risk of fuel cost increases. Some sorbents, such as Trona, may

be affected by natural gas price volatility.

Wet ESP: It is a mature, proven, well-demonstrated technology to reduce SO<sub>3</sub> emissions in industrial

plants, but there is little data available from any power plant firing high sulfur coal, with SCR in service,

and limestone forced oxidation FGD installed downstream of the dry ESP. Wet ESPs are installed in

Europe and Japan. In North America, five power plants installed Wet ESPs, AES Deepwater, Xcel

Energy's Sherco Station, New Brunswick Power's Dalhousie and Coleson Cove stations, and Dakota

Gasification Co. The wet ESP options require a large capital investment in equipment which is subject to a

very corrosive environment. The costs of the corrosion-resistant alloys needed for wet ESPs are currently

very volatile so there is a cost escalation risk. The corrosive environment also presents a risk of periodic

repair and/or replacement cost. Additionally, the wet ESP typically increases the pressure drop across the

system by 3-5 in W.G., depending on the arrangement. Fan curves provided by LG&E/KU indicate that

Ghent - Unit 1 and Mill Creek - Unit 3 may be at or near test block conditions with three complete layers

of catalyst and may not have sufficient margin for the additional pressure drop associated with a wet ESP.

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Purchasing the Ghent – Units 1&4 FGD and wet ESP from the same supplier would eliminate some of the commercial risk and place performance guarantee responsibility with one Contractor. For the vertical wet ESP it would also allow an integrated absorber – wet ESP design. Purchasing the wet ESP separately introduces an interface between the vendors, both a physical interface and a process interface which affects performance guarantees. However, the wet ESP can be purchased separately through competitive bidding with good definition of the process requirements to minimize commercial and performance guarantee risks.

Low Conversion Catalyst: Low conversion catalyst is a proven commodity in reducing SO<sub>3</sub> emissions at the stack outlet. Low conversion catalysts area available with typical guaranteed SO<sub>2</sub> to SO<sub>3</sub> conversion percentages between 0.6-0.8% for three layers of catalyst. This also comes at a cost as the NOx reduction capability of the catalyst is also reduced, thereby requiring more catalyst volume and more frequent catalyst replacement to replicate the NOx reduction efficiency of the existing catalyst. The use of the low conversion catalyst does have limitations, however, as this technology only reduces SCR generated SO<sub>3</sub>. This can have profound effects, for example, by completely switching to three layers of low conversion catalyst, Trimble County – Unit 1 SO<sub>3</sub> emissions can be reduced 43%, but this is still considerably higher than the target 5 ppm stack outlet concentration (90% SO<sub>3</sub> reduction).

Based on the capital costs, reagent costs, performance, reliability and operational impacts, the following risk ranking has been assigned for each technology.

Table 4-1: Risk Assessment Summary

Technology	Capital Cost	O&M Cost	Performance	Reliability	Overall
Alkaline Additives on Coal Belt	Low	Low	High	Low	High
Ammonia	Low	Low	High	Low	High
Humidification	Low	Low	High	Medium	High
Hydrated Lime	Low	Medium	Medium	Medium	Medium
Magnesium Hydroxide	Medium	Medium	Medium	Medium	Medium
Magnesium Oxide	Medium	Medium	High	Medium	High
Micronized Limestone	High	Medium	High	Medium	High
Sodium Bisulfite (SBS)	Low	Medium	Low	Medium	Low to Medium
Soda Ash	Low	Medium	Low	Medium	Low to Medium
Trona	Low	High	Low	Medium	Low to Medium
Vertical Wet ESP	High	Medium	Low	Medium	High
Horizontal Wet ESP	High	Medium	Low	Medium	High
Low Conversion Catalyst	Low	Low	Low	Low	Low

### 5. COST ANALYSES

### 5.1 INTRODUCTION

The alternatives considered for SO<sub>3</sub> mitigation at the LG&E/KU sites included several sorbent injection technologies, two options for wet electrostatic precipitators and replacement of the SCR catalyst with a low SO<sub>2</sub> to SO<sub>3</sub> conversion rate type of catalyst. The wet electrostatic precipitator options are high capital cost/low operating cost options. The sorbent injection technologies are low-to-medium capital cost/medium-to-high operating cost options (depending on the chemical chosen and its delivered cost). The low conversion rate SCR catalyst is a high cost option if a complete replacement of catalyst is made before the existing catalyst activity is exhausted. SCR catalyst replacement occurs periodically as a part of an overall catalyst management plan. If catalyst is only replaced on the schedule of the catalyst management plan, then the cost of low conversion rate catalyst would be an incremental cost premium above that of the original catalyst. The cost per cubic meter of low conversion rate catalyst is about the same as high conversion rate catalyst, but as much as 15% more low conversion catalyst volume is required to achieve the same NOx reduction efficiency.

### 5.2 ECONOMIC PARAMETERS

LG&E/KU will use the capital costs, sorbent costs, and operating parameters to evaluate the life cycle costs of the various alternatives. Below is a table summarizing the economic basis.

Table 5.1: Economic Basis

Cost Item		·
Auxiliary Power <sup>5</sup>	\$/MW-h	LG&E/KU
Estimated Outage Penalty <sup>2</sup>	\$/day	LG&E/KU
Estimated Outage Penalty	\$/MW-h	LG&E/KU
Anhydrous Ammonia – Delivered	\$/ton	\$300.00
Dry Hydrated Lime – Delivered	\$/ton	\$109.00
Dry Sorbacal H™ - Delivered	\$/ton	\$120.00 <sup>7</sup>
Magnesium Hydroxide Slurry - Delivered	\$/ton	\$210.00
Dry Magnesium Oxide - Delivered	\$/ton	\$450.00
Dry Micronized Limestone - Delivered	\$/ton	\$30.00
30wt% Sodium Bisulfite - Delivered	\$/ton	\$300.00
Dry Trona – Delivered <sup>6</sup>	\$/ton	\$205.00
Dry Soda Ash – Delivered	\$/ton	\$220.00
Dry Sodium Sulfite – Delivered	\$/ton	\$350.00

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Cost Item		
SBS or Soda Ash Licensing Fee	\$/MW/year	\$200.00
Low Conversion Catalyst	\$/m <sup>3</sup>	LG&E/KU
Softened Water	\$/kgal	\$0.06
O&M Personnel	\$/man-hour	LG&E/KU
Estimated Gypsum Byproduct (Sale) <sup>1</sup>	\$/ton	\$2.00
Estimated Gypsum Disposal (Landfill) 1,4	\$/ton	
Labor Escalation Rate	%/yr	
Discount Rate	%/yr	
Economic Life	years	25
Estimated Capacity Factor <sup>3, 4</sup>	% full load	LG&E/KU
Estimated Make-up Water Cost	\$/1,000 gal	LG&E/KU
Estimated FGD Purge Treatment Cost	\$/1,000 gal	LG&E/KU
Equipment and Material E	scalation Rates	
2006	%/yr	2.45%
2007	%/yr	2.33%
2008 and after	%/yr	2.32%

### Notes:

- 1 Assumes local landfill. Cost to load, haul, and place only.
- 2 Assumes typical spring or fall day.
- 3 Assumes emissions control equipment is installed and operating.
- 4 Assumes the unit capacity factor is constant for the entire 25-yr life cycle.
- 5 For the cost impact of lost generation, add together the auxiliary power cost (\$/MW-h) and the outage penalty cost (\$/MW-h). This would be the cost for year one of the analysis.
- 6 Rail delivery of Trona is \$160/ton with \$40/ton added for transferring from rail to truck for delivery to each site.
- 7 Chemical Lime Company plans to build a hydrator in the Louisville area and projects the cost of Sorbacal H<sup>™</sup> to be \$95-100/ton delivered.

### 5.3 ESTIMATED COST BASES

### 5.3.1 Structural Basis

Foundations sizes were determined based on estimated equipment sizes and representative soil data available for the Ghent and Mill Creek stations. For the purposes of this estimate, the soil conditions at Trimble County are assumed to be similar to those at Mill Creek.

Major structures and silos are assumed to be pile supported. Lighter structures are assumed to be supported on either mat foundations or on spread footings. Where pile foundations are used, the estimates assume the use of 18" diameter augered cast in place (ACIP) piles drilled to a depth of 50 feet at Ghent and 16" diameter ACIP piles drilled to a depth of 100 feet at the Mill Creek and Trimble County stations.

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Structural steel quantities are based on the proposed arrangements of the wet precipitator and ductwork.

The estimates are for new structural framing and do not include demolition or modifications to existing

structures.

Concrete walls were included for containment around all liquid sorbent storage tanks based on a six foot

wall height and a square area to provide a volume equal to the 10-day storage tank volume. Concrete lining

of the containment area was also included.

5.3.2 Electrical Basis

5.3.2.1 Mill Creek Unit 3

**Sorbent injection:** 

Expected loading will be approximately 800KVA total, This loading could be supplied for a single

4kV/480V Transformer feed from the 4kV Swgr 3B1. The other option would be to split the load between

two new MCCs which are supplied from the 480V Power Centers (one for the A bus and the other from the

B bus).

Wet ESP:

With the expected loading for the Wet ESP of 1800KVA/bus or 3600kVA total, there would be a 480V

double-ended switchgear located at the new ESP. This bus would be supplied power from the 4kV Bus

3A1 and 3B2.

5.3.2.2 Mill Creek Unit 4

Unit 4 would be similar to Unit 3 in its requirements.

Sorbent injection:

Expected Loading will be approximately 800KVA total, This loading could be supplied for a single

4kV/480V Transformer feed from the 4kV Swgr 4B1. The other option would be to split the load between

two new MCCs which are supplied from the 480V Power Centers (one for the A bus and the other from the

B bus).

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Wet ESP:

With the expected loading for the Wet ESP of 1800KVA/bus or 3600kVA total, there would be a 480V

double-ended switchgear located at the new ESP. This bus would be supplied power from the 4kV Bus

4A1 and 4B2.

5.3.2.3 Ghent Unit 1

**Sorbent injection:** 

Expected Loading will be approximately 800KVA total, This loading could be supplied for a single

4kV/480V Transformer feed from the Medium Voltage Swgr 1A or 1B. The other option would be to split

the load between two new MCCs which are supplied from the 480V Power Centers (one for the A bus and

the other from the B bus).

Wet ESP:

With the expected loading for the Wet ESP of 1800KVA/bus or 3600kVA total, there would be a 480V

double-ended switchgear located at the new ESP. This bus would be supplied power from the new FGD

Medium Voltage Switchgear that would be supplied as part of the new FGD installation.

5.3.2.4 Ghent Unit 3

**Sorbent injection:** 

Expected Loading will be approximately 800KVA total, This loading could be supplied for a single

4kV/480V Transformer feed from the Medium Voltage Swgr 3A or 3B. The other option would be to split

the load between two new MCCs which are supplied from the 480V Power Centers (one for the A bus and

the other from the B bus).

Wet ESP:

With the expected loading for the Wet ESP of 1800KVA/bus or 3600kVA total, there would be a 480V

double-ended switchgear located at the new ESP. This bus would be supplied power from the new FGD

Medium Voltage Switchgear that would be supplied as part of the new FGD installation.



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### 5.3.2.5 Ghent Unit 4

### **Sorbent injection:**

Expected Loading will be approximately 800KVA total, This loading could be supplied for a single 4kV/480V Transformer feed from the Medium Voltage Swgr 4A or 4B. The other option would be to split the load between two new MCCs which are supplied from the 480V Power Centers (one for the A bus and the other from the B bus).

### Wet ESP:

With the expected loading for the Wet ESP of 1800KVA/bus or 3600kVA total, there would be a 480V double-ended switchgear located at the new ESP. This bus would be supplied power from the new FGD Medium Voltage Switchgear that would be supplied as part of the new FGD installation.

### 5.3.2.6 Trimble County Unit 1

### Sorbent injection:

Expected Loading will be approximately 800KVA total, This loading could be supplied for a single 7kV/480V Transformer feed from the SDRS 7kV Swgr 1A1 or 1B1. The other option would be to split the load between two new MCCs which are supplied from the 480V Precipitator Power Centers (one for the A bus and the other from the B bus).

### Wet ESP:

With the expected loading for the Wet ESP of 1800KVA/bus or 3600kVA total, there would be a 480V double-ended switchgear located at the new ESP. This bus would be supplied power from the SDRS 7kV Swgr 1A1 or 1B1.

### 5.3.3 Mechanical Basis

Based on the attached flow diagrams (Exhibit 7.2) and equipment layout drawings (Section 9.0), an equipment list (Exhibit 7.1) was derived for each of the SO<sub>3</sub> mitigation options. Silo and tank sizing is based on the known density of the reagent material/slurry and the required storage time. The horsepower and related power requirements for the mechanical equipment (blowers, compressors, pumps, feed drives, Page 34 of 42

and jet mills) were based on both available vendor information and calculations based on the required flow rates of reagent. Air preheater basket replacement with enamel-coated baskets was included for the micronized limestone alternative.

Using the design basis table in section 4.2, the economic parameters discussed in section 4.1 and the estimated cost bases discussed in section 4.3, total levelized costs can be estimated by LG&E/KU for all SO<sub>3</sub> mitigation options. This will include a calculation of the estimated reagent cost, purchase and erection of the necessary equipment, as well as estimated costs for water usage and power loss. Below is a summary table of the capital costs for each SO<sub>3</sub> mitigation option. The complete cost estimates are attached in Section 8. For cost estimation purposes, Ghent – Units 3&4 and Mill Creek – Units 3&4 include long-term storage silos and mixing tanks that serve two units. Half of the cost of the two-unit equipment is included in the estimate to calculate the cost of a single unit.

Table 5.2: Total Installed Capital Cost

		Ghent 1	Ghent 3 <sup>1</sup>	Ghent 4 <sup>1</sup>	Mill Creek 3	Mill Creek 4	Trimble County 1
Option 1 – Hydrated Lime	Total Installed Capital Cost (\$)	\$5,326,070	\$5,343,160	\$5,343,160	\$5,030,150	\$5,343,160	\$4,941,540
Injection	Cost (\$)/kW	\$10.42	\$10.46	\$10.46	\$13.03	\$10.90	\$9.98
Option 2 – Mag. Hydroxide	Total Installed Capital Cost (\$)	\$8,286,000	\$8,343,500	\$8,115,300	\$8,125,400	\$8,308,500	\$8,438,600
Injection	Cost (\$)/kW	\$16.22	\$16.33	\$15.88	\$21.05	\$16.96	\$17.05
Option 3 – Soda	Total Installed Capital Cost (\$)	\$5,948,600	\$6,630,900	\$6,716,700	\$6,060,800	\$6,249,600	\$5,926,000
Ash Injection <sup>2</sup>	Cost (\$)/kW	\$11.64	\$12.98	\$13.14	\$15.70	\$12.75	\$11.97
Option 4 – SBS Injection <sup>2</sup>	Total Installed Capital Cost (\$)	\$7,699,200	\$6,621,400	\$6,798,000	\$7,565,600	\$7,921,800	\$7,843,800
Injection	Cost (\$)/kW	\$15.07	\$12.96	\$13.30	\$19.60	\$16.17	\$15.85
Option 5 –	Total Installed Capital Cost (\$)	\$5,267,900	\$4,932,800	\$5,194,700	\$5,353,600	\$4,745,800	\$4,617,400
Trona Injection	Cost (\$)/kW	\$10.31	\$9.65	\$10.17	\$13.87	\$9.69	\$9.33
Option 6 –	Total Installed Capital Cost (\$)	\$56,060,00 0	\$53,453,50 0	\$53,453,50 0	N/A	N/A	N/A
Vertical WESP	Cost (\$)/kW	\$109.71	\$104.61	\$104.61	N/A	N/A	N/A



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		Ghent 1	Ghent 3 <sup>1</sup>	Ghent 4 <sup>1</sup>	Mill Creek	Mill Creek 4	Trimble County 1
Option 7 – Horizontal	Total Installed Capital Cost (\$)	\$70,013,10 0	\$69,859,60 0	\$71,281,60 0	\$71,460,00 0	\$71,281,60 0	\$69,854,70 0
WESP	Cost (\$)/kW	\$137.01	\$136.71	\$139.49	\$185.13	\$145.47	\$141.12

### Notes:

- 1 This cost is for one unit, with a long-term, two-unit storage silo for dry sorbents, or a two-unit storage tank for wet sorbents, where applicable.
- 2 Sodium bisulfite or soda ash injection capital cost does not include the annual licensing fee of \$200/MW/year.

### 5.4 ESTIMATED FIRST YEAR O&M COSTS

In addition to the equipment procurement and erection costs shown above, there are also the operating costs that are expected. These include the cost of sorbent; auxiliary power requirements; softened water for dilution of magnesium hydroxide, SBS, or soda ash; and O&M labor required for maintenance of the mitigation technologies. The delivered cost of each sorbent is detailed above. Auxiliary power requirements have been estimated based upon the equipment required for each mitigation strategy. Labor required for O&M of the mitigation technology is based upon the experiences from the Cinergy Gibson Station, which indicates expected labor required for maintenance of these sorbent injection systems. This primarily consists of weekly cleaning of the injection nozzles, which requires 8-16 man-hours per week, depending on the injection strategy. Softened water is required to dilute the magnesium hydroxide from 60% by weight to the desired 15% by weight desired for injection or to dilute the SBS or soda ash to 10% by weight. The softened water system requires salt and resin, which are itemized in the O&M cost tables included as Section 8.2. The salt must be added daily, while the resin requires replacement once every seven years, regardless of the softened water demand. A summary table indicating expected fist-year O&M costs is included below.

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Table 5.3: First Year Operating Costs

Subtotal Cost	Ammonia	Humid. Water	Hydrated Lime	Magnesium Hydroxide	Magnesium Micronized Oxide Limestone	Micronized Limestone	Sodium Bisulfite <sup>1</sup>	Trona	Soda Ash¹	Wet ESP
Ghent 1	\$224,412	\$2,625,930	\$2,625,930	\$2,625,930	\$4,070,384	\$755,580	\$1,765,502 \$4,534,163	\$4,534,163	\$898,534	\$908,716
Ghent 3	\$233,342	\$2,739,076	\$2,739,076	\$2,739,076 \$2,924,756 \$4,246,892	\$4,246,892	\$784,998	\$784,998 \$1,836,147 \$4,728,868	\$4,728,868	\$931,220	\$944,195
Ghent 4	\$233,342	\$2,739,076	\$2,739,076	\$2,739,076 \$2,924,756 \$4,246,892	\$4,246,892	\$784,998	\$1,836,147 \$4,728,868	\$4,728,868	\$931,220	\$944,195
Mill Creek 3	\$144,160	\$144,160 \$1,609,161	\$1,609,161	\$1,609,161 \$1,731,633 \$2,484,219	\$2,484,219	\$491,219	\$491,219 \$1,105,652 \$2,784,472	\$2,784,472	\$579,806	\$788,198
Mill Creek 4	\$150,551	\$150,551 \$1,690,140	\$1,690,140	\$1,817,143	\$1,690,140 \$1,817,143 \$2,610,548	\$512,274	\$1,177,014 \$2,923,825	\$2,923,825	\$624,000	\$804,672
Trimble County 1	\$241,813 \$2,846,389	\$2,846,389	\$2,846,389	\$3,038,072	\$2,846,389 \$3,038,072 \$4,414,301	1 1	\$1,899,951	\$812,899 \$1,899,951 \$4,913,536	\$959,021	\$933,490

Notes:

1 - The cost of the licensing fee for SBS and soda ash has been included in the first-year operating costs shown above.

### 6. CONCLUSIONS AND RECOMMENDATIONS

LG&E/KU's choice of an SO<sub>3</sub> mitigation action plan for each of the LG&E/KU units should not be made on capital cost alone. LG&E/KU has agreed to prepare a life cycle cost analysis based on the data presented in this report. The least cost approach may be ammonia injection, but it will not reduce SO<sub>3</sub> sufficiently without detrimental effects on fly ash and gypsum sales and ash handling and disposal operations. The calcium-based sorbents are limited by resistivity impacts on the precipitators. Magnesium hydroxide injected in the furnace and the sodium-based sorbents, SBS and Trona, are more effective at mitigating SO<sub>3</sub>, at a higher operating cost than the calcium-based sorbents. The wet ESP technology has a long track record in other industries and good experience to date in the power industry, and also has co-benefits in reduction of fine particulates and mercury. However, the initial capital investment for the wet ESP is very high.

The combination of magnesium hydroxide injection in the furnace with hydrated lime or Trona injection downstream of the air preheater is a lower capital cost option with a good probability of success. The combination of a low SO<sub>2</sub> to SO<sub>3</sub> conversion catalyst and sodium bisulfite injection downstream of the air preheater is also promising. Either of these two sorbent injection options, combined with SO<sub>3</sub> reduction across existing (or planned future) equipment, will reduce the level at the stack exit to 5 ppm for Mill Creek – Units 3&4 or Ghent – Unit 1.

Due to the high SO<sub>2</sub> to SO<sub>3</sub> oxidation rate on the surface of the catalyst at Trimble County – Unit 1, a complete change-out of the current catalyst and replacement with low-conversion catalyst is recommended. This will alleviate much of the existing SO<sub>3</sub> emission concerns and the target emissions can be met through the use of sorbent injection upstream of the ESP. By changing out the catalyst completely, it can be assured that the plant will meet the target SO<sub>3</sub> emissions during periods when the fired coal is closer to the maximum indicated sulfur concentration (8.90lb/MBtu) without requiring additional mitigation technologies.

Units 3&4 at Ghent have existing hot-side ESPs, which limit the use of sorbent injection downstream of the air preheater. The FGD system particulate collection capability may allow some sorbent injection. As such, Ghent – Units 3&4 will likely require a wet ESP to reduce stack SO<sub>3</sub> emissions to 5 ppm or a combination

of Mg(OH)<sub>2</sub> injection in the furnace, replacement of all catalyst with low conversion catalyst and some sorbent injection such as SBS or hydrated lime upstream of the FGD system.

Shown below is a table summarizing the applicability of each technology investigated for SO<sub>3</sub> mitigation at each of the LG&E/KU sites. This table reflects published results of recent testing only.

Table 6-1: Summary of Technology Applicability

	Ghent 1	Ghent 3	Ghent 4	Mill Creek	Mill Creek 4	Trimble County 1
Ammonia Injection	No	No	No	No	No	No
Flue Gas Humidification	No	No	No	No	No	No
Hydrated Lime Injection	Yes	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes	Yes	Yes
Mag. Hydroxide Injection	No	Yes	Yes	No	No	Yes
Magnesium Oxide Injection	No	No	No	No	No	No
Micronized Limestone Injection	No	No	No	No	No	No
OmniClear System	No	No	No	No	No	No
Soda Ash Injection	Yes	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes	Yes	Yes
SBS Injection	Yes	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes	Yes	Yes
Trona Injection	Yes	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes	Yes	Yes
Vertical WESP	Yes	Yes	Yes	No	No	No
Horizontal WESP	No	No	No	Yes	Yes	Yes
Low Conversion Catalyst	Yes	Yes	Yes	Yes	Yes	Yes

Note: 1. The quantity of sorbent injected downstream of the hot-side ESP is limited by the ability of the Wet FGD system to collect particulate matter. One of these technologies could be combined with Low Conversion Catalyst and/or Magnesium Hydroxide injection in the furnace. Testing of Trona injection upstream of the ESP and hydrated lime injection upstream of the wet FGD is planned for Ghent – Unit 1.

- 7. EXHIBITS
- 7.1 EQUIPMENT LIST
- 7.2 FLOW DIAGRAMS
- 7.3 ESP DESIGN DATA

- 8. APPENDICES
- 8.1 CAPITAL COST ESTIMATES
- 8.2 FIRST YEAR O&M COSTS

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### 9. DRAWINGS

### 7.1: Equipment List

	Ghent 1	Ghent 3	Ghent 4
		Hydrated Lime	
Equipment	Description	Description	Description
Air Blowers (5 Qty)	150 HP each (Moving -7,605 lb/hr of Solid Material to the Injection Manifold)	150 HP each (Moving ~8,397 lb/hr of Solid Material to the Injection Manifold)	150 HP each (Moving ~8,397 lb/hr of Solid Material to the Injection Manifold)
VFD Rotary Feeder (3 Qty)	3 HP - Stainless Steel	3 HP - Stainless Steel	3 HP - Stainless Steel
Long-Term Storage Silo (10 Days)	1,623,700 lb fuli - 12,467 ft <sup>3</sup> - D=15.8' - H=63.3' - CS Silo - SS Hopper	1,694,400 lb full - 13,011 ft <sup>3</sup> - D=16.1' - H=64.2' - CS Silo - SS Hopper	1,694,400 lb full - 13,011 ft <sup>3</sup> - D=16.1' - H=64.2' - CS Silo - SS Hopper
Long-Term Storage Silo (10 Days) (Common Tanks)		3,388,800 lb full - 26,021 ft3 - D=20	0.2' - H=80.9' - CS Silo - SS Hopper
Short-Term Storage Silo (24 Hours)	162,400 lb full - 1,247 ft³ - D=7.3' - H=29.4' - CS Silo - SS Hopper	169,500 lb full - 1301 ft <sup>3</sup> - D=7.5' - H=30.0' - CS Silo - SS Hopper	169,500 lb full - 1301 ft³ - D=7.5' - H=30.0' - CS Silo - SS Hopper
Short-Term Storage Silo (24 Hours) (Common Tanks)		338,900 lb full - 2,602 ft3 - D=9.4	I' - H=37.6' - CS Silo - SS Hopper
Injection Manifold (2 Qty)	Stainless Steel	Stainless Steel	Stainless Steel
Injection Nozzles (50 Oty)	Stainless Steel	Stainless Steel	Stainless Steel
Piping	L=450' - D=8" - CS	L=450' - D=8" - CS	L=450' - D=8" - CS
		Magnesium Hydroxide	
Equipment	<u>Description</u>	<u>Description</u>	<u>Description</u>
VFD Rotary Feeder (1 Oty)	3 HP - Stainless Steel	3 HP - Stainless Steel	3 HP - Stainless Steel
Storage Tank (10 days)	894,200 lb full • 10,842 ft <sup>3</sup> • D=22.6' • H=27.1' • CS Sito • SS Hopper	933,160 lb fuli - 11,314 ft³ - D=22.9' - H=27.5' - CS Silo - SS Hopper	933,160 lb full - 11,314 ft3 - D=22.9' - H=27.5' - CS Silo - SS Hopper
Storage Tank (10 days) (Common Tank)		1,866,320 lb full - 22,630 ft3 - D=2i	8.8' - H=34.6' - CS Silo - SS Hopper
Air Compressors (2 Qty)	2 x 100% - 75 HP	2 x 100% - 75 HP	2 x 100% - 75 HP
Mixing Tank (24 Hours)	89,420 lb full - 8,249 ft <sup>3</sup> - D=17.4' - H=20.9' - CS	93,160 lb tull - 8,608 ft³ - D=20.9' - H=25.1' - CS	93,160 lb full - 8,608 ft3 - D=20.9' - H=25.1' - CS
Mixing Tank (24 Hours) (Common Tank)		186,700 lb full -17,219 ft3 - D=26	.3' - H≖31.6' - CS Silo - SS Hopper
Mixing Tank Agitator (1 Qty)	CS Shaft - 20 HP	CS Shaft - 20 HP	CS Shaft - 20 HP
Slurry/Water Pumps (6 Qty)	CS - 5.0 HP (possibly positive displacement or turbine pumps)	CS - 5.0 HP (possibly positive displacement or turbine pumps)	CS - 5.0 HP (possibly positive displacement or turbine pumps)
3	Stainless Steel	Stainless Steel	Stainless Steel
Dual Fluid Injection Nozzles (20 Oty)	Stainless Steel	Stainless Steel	Stainless Steel
Piping (Insulation and Lagging)	L=50' - D=6" - CS / L=300' - D=2" - CS	L=50' - D=6" - CS / L=300' - D=2" - CS	L=50' · D=6" - CS / L=300' · D=2" - CS

		Ghent 1	Ghent 3	Ghent 4
Purps   Dots			Sodium Bisulfite (SBS)	
Adjuster (1 Oby)	Equipment	Description	Description	Description
Section   Sect	Pumps (6 Oty)	2 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP	2 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP	2 · CS internals - 2.0 HP / 4 · SS internals - 1.0 HP
Aplation (1 Oby)	SBS Solution Tank (10 Days)	456, 195 lb full - 7,643 ft <sup>3</sup> - D=20.1' - H=24.1' - SS	476,070 lb full - 7,664 ft <sup>3</sup> - D=20.4' - H=24.5' - SS	476,070 lb full - 7,664 ft3 - D=20.4' - H=24.5' - SS
A Compression (C Only)	SBS Solution Tank (10 Days) (Common Tank)		952,140 lb full - 15,952 ft3	- D=25.7 - H=30.8' - SS
Notice   State   Sta	Agitator (1 Oty)	SS Shaft - 20 HP	SS Shaft - 20 HP	SS Shaft - 20 HP
Dual Plud Piecton Nazzes (100 Orb)   Sairless Steel   Sairless Steel   Sairless Steel   Sairless Steel	Air Compressors (2 Qty)	2 x 100% - 50 HP	2 x 100% - 50 HP	2 x 100% - 50 HP
Piprog (resultation, Lagging, and Heal Tracing)	Injection Manifold (2 Oty)	Stainless Steel	Stainless Steel	Stainless Steel
Soda Ash   Education   Description   Description   Description   Description   Description	Dual Fluid Injection Nozzles (100 Oty)	Stainless Steel	Stainless Steel	Stainless Steel
Pumps (6 Orly)	Piping (Insulation, Lagging, and Heat Tracing)	L=250' - D=6" - SS / L=50' - D=6" - CS / L=50' - D=4" - SS	L=250' - D=6" - SS / L=50' - D=6" - CS / L=50' - D=4" - SS	L=250' - D=6" - SS / L=50' - D=6" - CS / L=50' - D=4" - SS
Pumps (6 Oy) 2 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 2 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 2 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 2 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 2 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 2 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 2 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 2 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 2 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 2 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 2 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 3 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 3 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 3 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 3 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 3 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 3 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 3 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 3 - CS Internals - 2.0 MP / 4 - SS Internals - 1.0 MP 3 - CS Internals -			Soda Ash	
Sod Ash Solution Tank (10 Days)   222,250 b tull -3,293 ts 2 - D=15.2" + H=18.2" \ SS   242,350 b tull -3,436 ts 2 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 2 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 2 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 2 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 2 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 2 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 2 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 2 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 2 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 2 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 3 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 3 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 3 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 3 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 3 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 3 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 3 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 3 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 3 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 3 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 3 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 3 - D=15.4" + H=18.5" \ SS   242,350 b tull -3,436 ts 3 - D=15.4" + H=2.3" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.3" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.23" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.23" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.23" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.23" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.23" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.23" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.23" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.23" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.23" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.23" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.23" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.23" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.5" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.5" \ SS   Path 12,20 ts 3 - D=15.4" + H=2.5" \ SS   Path 12,20 ts 3 - D=15.4" + H=2	Equipment	Description	Description	<u>Description</u>
Scote Ach Southern Tark (10 Days) (Common Tark)   Tark (10 D	Pumps (6 Oty)	2 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP	2 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP	2 · CS internals · 2.0 HP / 4 · SS internals · 1.0 HP
Aglator (1 Ohy)   SS Shaft - 20 HP   Shaft - 20 HP   SS Shaft - 20 HP   Shaft -	Soda Ash Solution Tank (10 Days)	232,260 lb full - 3,293 ft <sup>3</sup> - D=15.2' - H=18.2' - SS	242,380 lb full - 3,436 ft <sup>3</sup> - D=15.4' - H=18.5' - SS	242,380 lb full - 3,436 ft3 - D=15.4' - H=18.5' - SS
Agistator (1 Oby)         SS Shaft - 20 HP         SS Shaft - 20 HP         SS Shaft - 20 HP           Air Compressors (2 Oby)         2 x 100% - 50 HP         2 x 100% - 50 HP         2 x 100% - 50 HP           Injection Marridol (2 Oby)         Stainless Steel         Stainless Steel         Stainless Steel           Dual Fluid Injection Nozzies (100 Oby)         Stainless Steel         Stainless Steel         Stainless Steel           Piping (Insulation, Lagging, and Heat Tracing)         L=250° -D=6° -SS / L=50° -			484,760 lb full - 6,872 ft3	- D≃19.4' - H=23.3' - SS
Prince   P		SS Shaft - 20 HP	SS Shaft - 20 HP	SS Shaft - 20 HP
Dual Fluid Injection Nozzies (100 Oity)   Stainless Steel   Stai	Air Compressors (2 Qty)	2 x 100% - 50 HP	2 x 100% - 50 HP	2 x 100% - 50 HP
Pping (Insulation, Lagging, and Heat Tracing)   L=250' · D=6' · SS / L=50' · D=6' · CS / L=50' · D=6' ·	Injection Manifold (2 Qty)	Stainless Steel	Stainless Steel	Stainless Steel
Paper   Common   Pape	Dual Fluid Injection Nozzles (100 Oty)	Stainless Steel	Stainless Steel	Stainless Steel
Equipment         Description         Description         Description         Operation           Air Blowers (6 Oty)         150 HP each (Moving -6,958 lb/hr of Solid Material to the Injection Manifold)         150 HP each (Moving -7,683 lb/hr of Solid Material to the Injection Manifold)         150 HP each (Moving -7,683 lb/hr of Solid Material to the Injection Manifold)           VFD Rotary Feeder (3 Ohy)         3 HP - Stainless Steel         3 HP - Stainless Steel         3 HP - Stainless Steel           Long-Term Storage Silo (10 Days)         1,485,585 lb full -12,976 ft <sup>2</sup> - D=16,0" +H=64.2" - CS Silo - SS Hopper         1,550,313 lb full -13,541 ft <sup>2</sup> - D=16,3" +H=65.1" - CS Silo - SS Hopper           Long-Term Storage Silo (10 Days) (Common Tarks)         3,100,625 lb full -27,082 ft/3 - D=2,5" - H=82,0" - CS Silo - SS Hopper           Short-Term Storage Silo (24 Hours)         148,558 lb full -1,300 ft <sup>3</sup> - D=7,4" - H=29,8" - CS Silo - SS Hopper         155,031 lb full -1,354 ft/3 - D=7,6" - H=30,2" - CS Silo - SS Hopper           Short-Term Storage Silo (24 Hours) (Common Tarks)         155,031 lb full -1,354 ft/3 - D=7,6" - H=30,2" - CS Silo - SS Hopper         155,031 lb full -1,354 ft/3 - D=7,6" - H=30,2" - CS Silo - SS Hopper           Injection Manifold (2 Ohy)         Stainless Steel         Stainless Steel         Stainless Steel           Injection Nozzies (50 Ohy)         Stainless Steel         Stainless Steel         Stainless Steel	Piping (Insulation, Lagging, and Heat Tracing)	L=250' - D=6" - SS / L=50' - D=6" - CS / L=50' - D=4" - SS	L=250' - D=6" - SS / L=50' - D=6" - CS / L=50' - D=4" - SS	L=250' - D=6" - SS / L=50' - D=6" - CS / L=50' - D=4" - SS
Air Blowers (6 City)  150 HP each (Moving -6,958 bt/hir of Solid Material to the Injection Manifold)  VFD Rotary Feeder (3 Ohy)  3 HP - Stainless Steel  5 Stainless Steel  5 Stainless Steel  5 Stainless Steel  5 Stainless Steel			Trona	
Air Blowers (6 Cty)  Marrifold)  VFD Rotary Feeder (3 Oty)  3 HP - Stainless Steel  3 HP - Stainless Steel  3 HP - Stainless Steel  1,485,585 to full - 12,976 ft <sup>3</sup> - D=16,0° - H=64.2° - CS Silo - SS Hopper  Long-Term Storage Silo (10 Days)  Long-Term Storage Silo (10 Days) (Common Tanks)  Short-Term Storage Silo (24 Hours)  Short-Term Storage Silo (24 Hours)  Physical Steel  148,558 to full - 1,300 ft <sup>3</sup> - D=7,4° - H=29,8° - CS Silo - SS Hopper  Short-Term Storage Silo (24 Hours)  Short-Term Storage Silo (24 Hours)  Short-Term Storage Silo (24 Hours)  Tanks)  Tinjection Manifold (2 Oty)  Stainless Steel	Equipment	Description	<u>Description</u>	
Cong-Term Storage Silo (10 Days)   1,485,585 to full - 12,976 ft   2 - Deft.0' - H=64.2' - CS Silo - SS   1,550,313 ib full - 13,541 ft   2 - Deft.0' - H=65.1' - CS Silo - SS   1,550,313 ib full - 13,541 ft   3 - Deft.0' - H=65.1' - CS Silo - SS   Hopper	Air Blowers (6 Oty)	150 HP each (Moving ~6,958 lb/hr of Solid Material to the Injection Manifold)	150 HP each (Moving ~7,683 lb/hr of Solid Material to the Injection Manifold)	
Long-Term Storage Silo (10 Days)  Long-Term Storage Silo (10 Days) (Common Tanks)  Short-Term Storage Silo (24 Hours)  Short-Term Storage	VFD Rotary Feeder (3 Oty)	3 HP - Stainless Steel	3 HP - Stainless Steel	3 HP - Stainless Steel
Short-Term Storage Silo (24 Hours)   148,558 ib full - 1,300 ft <sup>3</sup> - D=7.4° · H=29.8° · CS Silo - SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.6° · H=30.2° · CS Silo · SS Hopper   155,031 ib full - 1,354 ft <sup>3</sup> - D=7.	Long-Term Storage Silo (10 Days)			
Short-Term Storage Silo (24 Hours) (Common Tanks)  Injection Manifold (2 Oty)  Stainless Steel			3,100,625 lb full - 27,082 lt3 - D=2l	0.5' - H=82.0' - CS Silo - SS Hopper
Tanks)  Injection Manifold (2 Oty)  Stainless Steel	Short-Term Storage Silo (24 Hours)	148,558 lb full - 1,300 ft <sup>3</sup> - D=7.4' - H=29.8' - CS Silo - SS Hopper	155,031 lb full - 1,354 ft <sup>3</sup> - D=7.6' - H=30.2' - CS Silo - SS Hopper	155,031 lb full - 1,354 ft3 - D=7.6' - H=30.2' - CS Silo - SS Hopper
Injection Nozzles (50 Oty)  Stainless Steel  Stainless Steel  Stainless Steel  Stainless Steel			310,065 lb full - 2,708 ft3 - D=9.9	5' - H=38.1' · CS Silo · SS Hopper
Nyecion Nozzes (50 City) Galeria Gibbs	Injection Manifold (2 Qty)	Stainless Steel	Stainless Steel	Stainless Steel
Piping L=450' · D=8" · CS L=450' · D=8" · CS L=450' · D=8" · CS	Injection Nozzles (50 Oty)	Stainless Steel	Stainless Steel	Stainless Steel
	Piping	L=450' · D=8" · CS	L=450' - D=8" - CS	L=450' - D=8" - CS

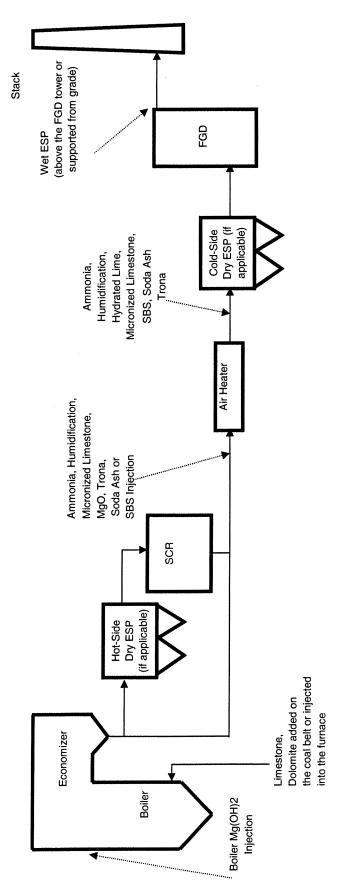
Valving, instrumentation, controls, auxiliary power equipment, DCS, and foundation requirements are not included. All equipment is on a per unit basis except for the long-term storage silos/tanks.

	Mill Creek 3	Mill Creek 4	Trimble County 1
		Hydrated Lime	
Equipment	Description	<u>Description</u>	Description
Air Blowers (5 City)	150 HP each (Moving -4,104 lb/hr of Solid Material to the Injection Manifold)	150 HP each (Moving ~4,315 lb/hr of Solid Material to the Injection Manifold)	150 HP each (Moving ~12,240 lb/hr of Solid Material to the Injection Manifold)
VFD Rotary Feeder (3 Oty)	3 HP - Stainless Steel	3 HP - Stainless Steel	3 HP - Stainless Steel
Long-Term Storage Silo (10 Days)	985,000 lb full - 7,563 ft <sup>3</sup> - D=13.4' - H=53.6' - CS Silo - SS Hopper	1,035,800 lb full - 7,953 ft³ - D=13.6' - H=54.5' - CS Silo - SS Hopper	1,761,500 lb full - 13,526 ft <sup>3</sup> - D=16.3' - H=65.1' - CS Silo - SS Hopper
Long-Term Storage Silo (10 Days) (Common Tanks)	2,020,600 lb full - 15,516 ft3 - D=17.0	' - H=68.1' - CS Silo - SS Hopper	
Short-Term Storage Silo (24 Hours)	98,500 lb full - 756 ft <sup>3</sup> - D=6.2' - H=24.9' - CS Silo - SS Hopper	103,580 lb full - 795 ft <sup>3</sup> - D=6.3' - H=25.3' - CS Silo - SS Hopper	176,150 lb full - 1353 ft <sup>3</sup> - D=7,6' - H=30.2' - CS Silo - SS Hopper
Short-Term Storage Silo (24 Hours) (Common Tanks)	202,060 lb full - 1,552 ft3 - D=7.9' -	H=31.6' - CS Silo - SS Hopper	
Injection Manifold (2 Oty)	Stainless Steel	Stainless Steel	Stainless Steel
Injection Nazzles (50 Oty)	Stainless Steel	Stainless Steel	Stainless Steel
Piping	L=450' - D=8" - CS	L=450' - D=8" - CS	L=450' - D=8" - CS
		Magnesium Hydroxide	
<u>Equipment</u>	<u>Description</u>	<u>Description</u>	Description
VFD Rotary Feeder (1 Oty)	3 HP - Stainless Steel	3 HP - Stainless Steel	3 HP - Stainless Steel
Storage Tank (10 days)	542,448 lb full - 6,577 ft <sup>3</sup> - D=19.1' - H=22.9' - CS Silo - SS Hopper	570,405 lb tull - 6,916 ft <sup>3</sup> - D=19.4' - H=23.3' - CS Silo - SS Hopper	970,120 lb full - 11,762 ft <sup>3</sup> - D=23.2' - H=27.8' - CS Silo - SS Hopper
Storage Tank (10 days) (Common Tank)	1,112,852 lb full - 13,493 ft3 - D=24.3	3' - H=29.1' - C\$ Silo - SS Hopper	
Air Compressors (2 Oty)	2 x 100% - 75 HP	2 x 100% - 75 HP	2 x 100% - 75 HP
Mixing Tank (24 Hours)	54,245 ib fuil • 5,004 ft³ • D=17.4' • H=20.9' • CS	57,041 lb tull - 5,262 ft³ - D=17.7' - H=21.3' - CS	97,012 ib full - 8,950 ft <sup>3</sup> - D=21.2' - H=25.4' - CS
Mixing Tank (24 Hours) (Common Tank)	111,285 lb full - 10,266 ft3 - D=22.2	- H=26.6' - CS Silo - SS Hopper	
Mixing Tank Agitator (1 Oty)	CS Shaft - 20 HP	CS Shaft - 20 HP	CS Shaft - 20 HP
Sturry/Water Pumps (6 Oty)	CS - 5.0 HP (possibly positive displacement or turbine pumps)	CS - 5.0 HP (possibly positive displacement or turbine pumps)	CS - 5.0 HP (possibly positive displacement or turbine pumps)
3	Stainless Steel	Stainless Steel	Stainless Steel
Dual Fluid Injection Nozzles (20 Qty)	Stainless Steel	Stainless Steel	Stainless Steel
Piping (Insulation and Lagging)	L=50' - D=6" - CS / L=300' - D=2" - CS	L=50' - D=6" - CS / L=300' - D=2" - CS	L=50' - D=6" - CS / L=300' - D=2" - CS

	Mill Creek 3	Mill Creek 4	Trimble County 1
		Sodium Bisulfite (SBS)	
Equipment	Description	Description	Description
Pumps (6 Oty)	2 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP	2 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP	2 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP
SBS Solution Tank (10 Days)	276,740 lb full - 4,637 ft <sup>3</sup> - D=17.0' - H=20.4' - SS	291,003 lb full - 4,876 ft <sup>3</sup> - D=17.3' - H=20.8' - SS	494,925 ib full - 8,292 ft3 - D=20.6' - H=24.8' - SS
SBS Solution Tank (10 Days) (Common Tank)	567,743 lb full - 9,512 ft3 -	D=21.6' - H=25.9' - SS	
Agitator (1 Oty)	SS Shaft - 20 HP	SS Shaft - 20 HP	SS Shaft - 20 HP
Air Compressors (2 Qty)	2 x 100% - 50 HP	2 x 100% - 50 HP	2 x 100% - 50 HP
Injection Manifold (2 Oty)	Stainless Steel	Stainless Steel	Stainless Steel
Dual Fluid Injection Nozzles (100 Qty)	Stainless Steel	Stainless Steel	Stainless Steel
Piping (Insulation, Lagging, and Heat Tracing)	L=250' - D=6" - SS / L=50' - D=6" - CS / L=50' - D=4" - SS	L=250' - D=6" - SS / L=50' - D=6" - CS / L=50' - D=4" - SS	L=250' - D=6" - S\$ / L=50' - D=6" - C\$ / L=50' - D=4" - \$8
		Soda Ash	
Equipment	Description	<u>Description</u>	Description
Pumps (6 Oty)	2 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP	2 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP	2 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP
Soda Ash Solution Tank (10 Days)	140,896 to full - 1,997 ft <sup>3</sup> - D=12.8' - H=15.4' - SS	148,157 lb full - 2,100 ft <sup>3</sup> - D=13.1' - H=15.7' - SS	2251,980 lb full - 3,572 ft <sup>3</sup> - D=15.6' - H=18.7' - SS
Soda Ash Solution Tank (10 Days) (Common Tank)	289,053 lb full - 4,100 ft3 -	D=16.3' - H=19.6' - SS	
Agitator (1 Oty)	SS Shaft - 20 HP	SS Shaft - 20 HP	SS Shaft - 20 HP
Air Compressors (2 Qty)	2 x 100% - 50 HP	2 x 100% - 50 HP	2 x 100% - 50 HP
Injection Manifold (2 Oty)	Stainless Steel	Stainless Steel	Stainless Steel
Dual Fluid Injection Nozzles (100 Qty)	Stainless Steel	Stainless Steel	Stainless Steel
Piping (Insulation, Lagging, and Heat Tracing)	L=250' • D=6" • SS / L=50' • D=6" • CS / L=50' • D=4" • SS	L=250' - D=6" - SS / L=50' - D=6" - CS / L=50' - D=4" - SS	L=250' - D=6" - SS / L=50' - D=6" - CS / L=50' - D=4" - S
		Trona	
Equipment	Description	Description	Description
Air Blowers (6 Oty)	150 HP each (Moving ~3,755 lb/hr of Solid Material to the Injection Manifold)	150 HP each (Moving ~3,949 lb/hr of Solid Material to the Injection Manifold)	150 HP each (Moving ~11,200 lb/hr of Solid Material to th Injection Manifold)
VFD Rotary Feeder (3 Oty)	3 HP · Stainless Steel	3 HP - Stainless Steel	3 HP - Stainless Steel
Long-Term Storage Silo (10 Days)	901,199 lb tull - 7,871 tt <sup>3</sup> - D=13.6' - H=54.3' - CS Silo - SS Hopper	947,646 lb full - 8,277 ft <sup>3</sup> - D=13.8' - H=55.2' - CS Silo - SS Hopper	1,611,715 ib full - 14,077 ft <sup>3</sup> - D=16.5' - H=65.9' - CS Silo SS Hopper
Long-Term Storage Silo (10 Days) (Common Tanks)	1,848,845 lb full - 16,150 ft3 - D=17.3	3' - H=69.0' - CS Silo - SS Hopper	
Short-Term Storage Silo (24 Hours)	90,120 lb full - 787 ft <sup>3</sup> - D=6.3' - H=25.2' - CS Sito - SS Hopper	94,765 lb full - 828 ft <sup>3</sup> - D=6.4' - H=25.6' - CS Silo - SS Hopper	161,172 lb full - 1,410 ft <sup>3</sup> - D=7.7' - H=30.6' - CS Silo - St Hopper
Short-Term Storage Silo (24 Hours) (Common Tanks)	184,885 lb full - 1,615 ft3 - D=8.0°	H=32.0' - CS Silo - SS Hopper	
Injection Manifold (2 Oty)	Stainless Steel	Stainless Steel	Stainless Steel
Injection Nozzles (50 Oty)	Stainless Steel	Stainless Steel	Stainless Steel
Piping	L=450' - D=8" - CS	L=450' - D=8" - CS	L=450' - D=8" - CS
· · · · · · · · · · · · · · · · · · ·	Valving, instrumentation, co All equipm	Introls, auxiliary power equipment, DCS, and foundation require ent is on a per unit basis except for the long-term storage silos	tments are not included. Itanks.

### 7.2: Flow Diagrams

Exhibit 7.2: Mitigation Technology Entry Points



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## Exhibit 7.2.1: Ammonia Injection

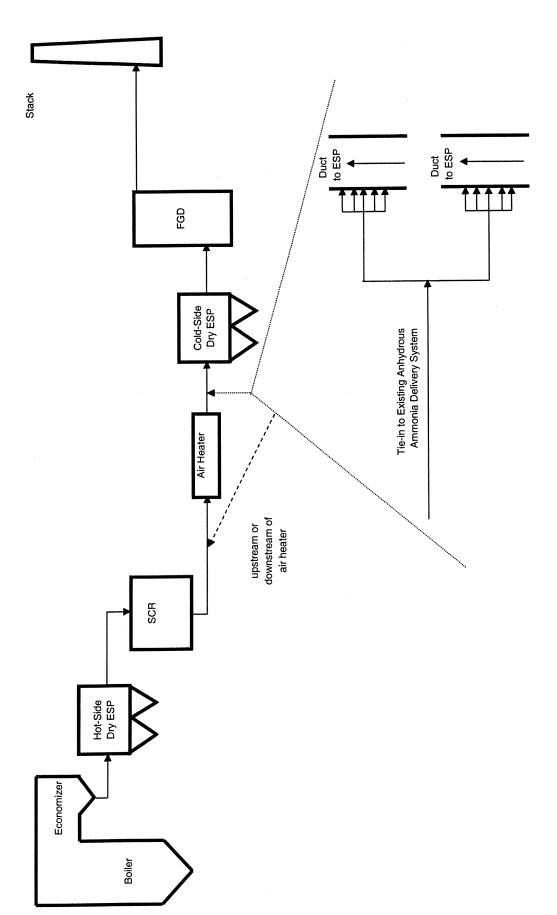
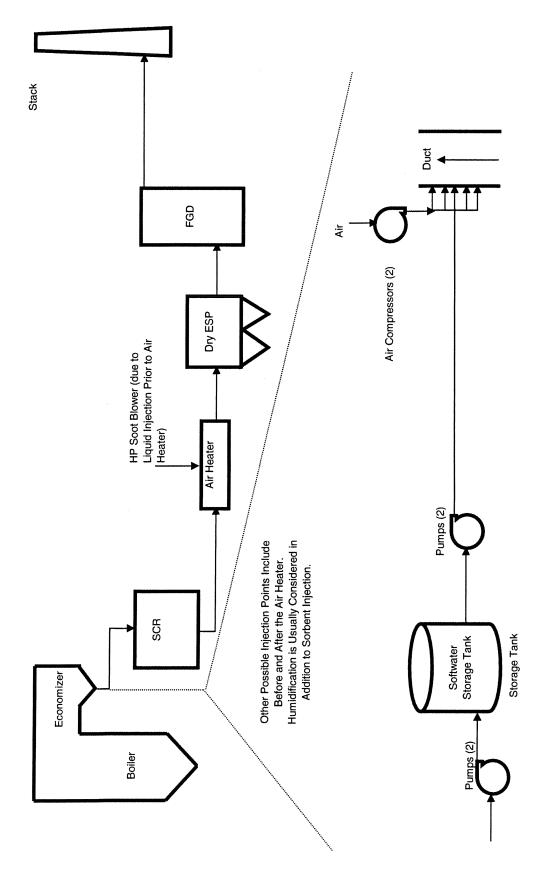


Exhibit 7.2.2: Flue Gas Humidification



Stack

FGD

LP Soot Blower (due to Solids Injection Prior to Air

Heater)

SCR

Boiler

Economizer

Cold-Side Dry ESP

Air Heater

Magnesium Oxide

or Micronized Limestone

Hydrated Lime

or Trona

Exhibit 7.2.3: Dry Sorbent Injection (Cold-Side ESP)

(Hydrated Lime, Magnesium Oxide, Micronized Limestone, Trona)

# Micronized limestone will also include a 'jet mill' prior to duct injection, but it is not shown above.

Duct

Blowers (2)

Blowers (2)

Rotary Feeder w/ VFD

Blower (1)

Truck Unloading

Duct

24-hr Day Bin

10-Day Storage Silo

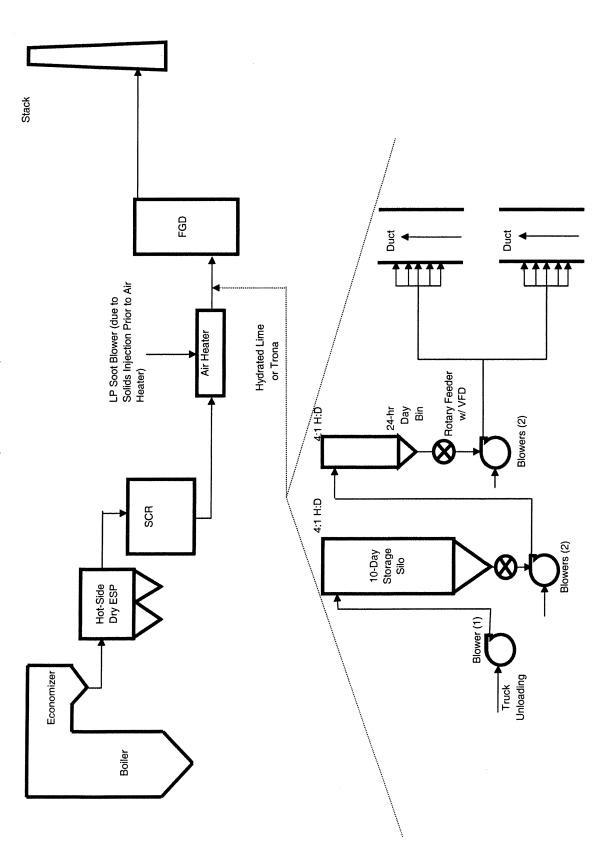
### Flow Diagrams (final).xls

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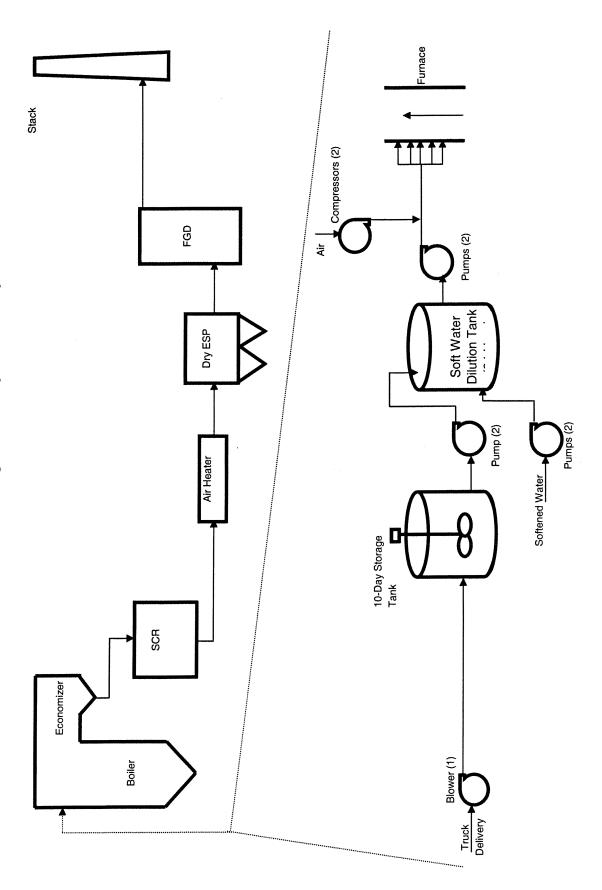
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Flow Diagrams (final).xls

# Exhibit 7.2.3: Dry Sorbent Injection (Hot-Side ESP) (Hydrated Lime, Trona)

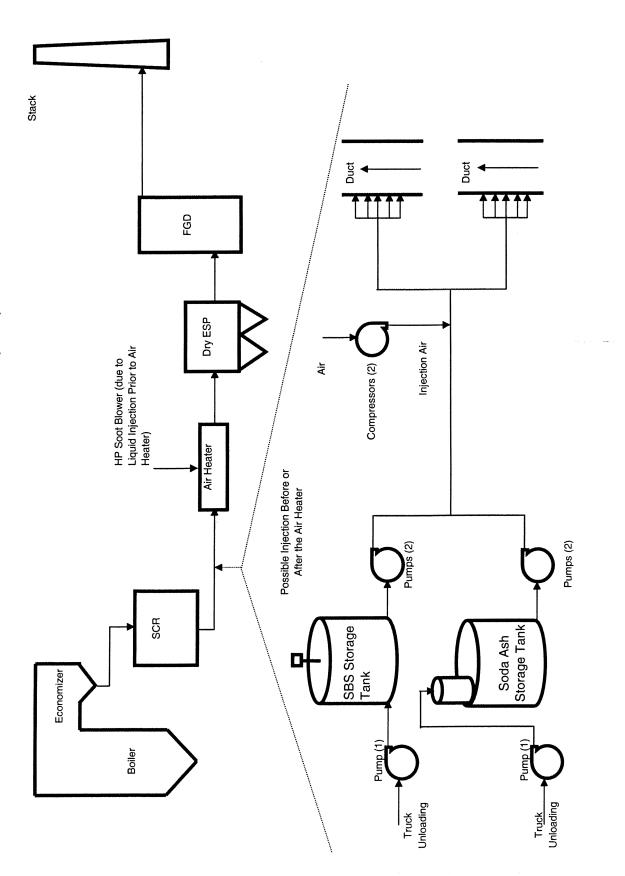


### Exhibit 7.2.4: Magnesium Hydroxide Injection



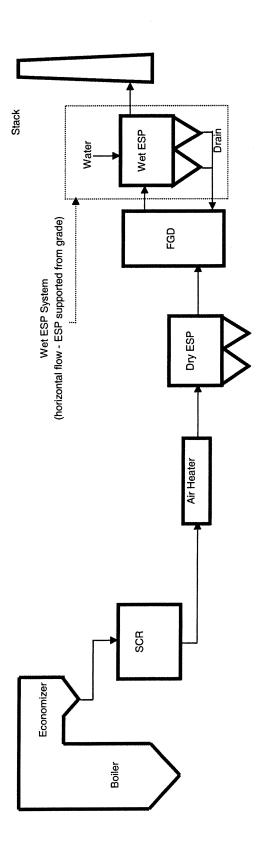
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Exhibit 7.2.5: Sodium BiSulfite (SBS) or Soda Ash

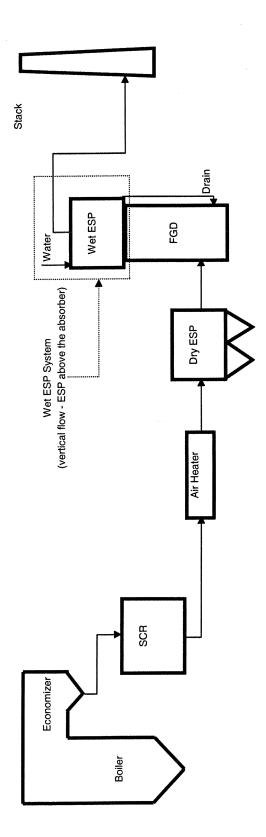


Flow Diagrams (final).xls

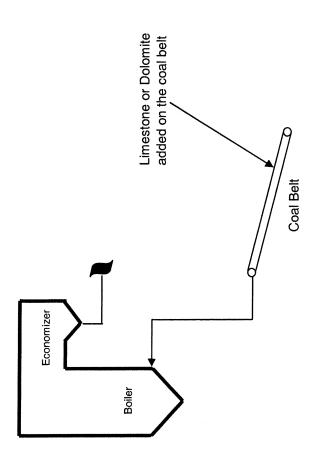
Exhibit 7.2.6: Stand-Alone Wet ESP - Horizontal Flow



# Exhibit 7.2.7: Absorber-Mounted Wet ESP - Vertical Flow



## Exhibit 7.2.8: Alkaline Additives to the Coal Belt



Project No. 10584-022 January 27, 2006

### 7.3: ESP Design Data

### SARGENT & LUNDY

### LOUISVILLE GAS & ELECTRIC, VARIOUS UNITS ELECTROSTATIC PRECIPITATOR DESIGN DATA (2005)

LINE NO.	DESCRIPTION	MILL CREEK #3	MILL CREEK # 4	GHENT #1	GHENT #3	GHENT # 4	TRIMBLE COUNTY # 1
-	UNIT RATING, MW <sub>net</sub>	386	490	511	511	511	495
2	PLATE HEIGHT	33	35	30	36	36	49
3	NUMBER OF MECHANICAL FIELDS	4	4	4	4	4	4
4	NUMBER OF ELECTRICAL FIELDS	4	4	4	4	4	5
5	LENGTH OF FIRST ELECTRICAL FIELD, (FT)	8.23	9.88	6.75	3.00	3.00	11.20
9	LENGTH OF SECOND ELECTRICAL FIELD, (FT)	8.23	9.88	6.75	3.00	3.00	11.20
7	LENGTH OF THIRD ELECTRICAL FIELD, (FT)	8.23	8.23	6.75	3.00	3.00	11.20
80	LENGTH OF FOURTH ELECTRICAL FIELD, (FT)	8.23	8.23	6.75	3.00	3.00	11.20
6	LENGTH OF FIFTH ELECTRICAL FIELD, (FT)	0.00	0.00	00:0	3.00	3.00	11.20
10	TOTAL PLATE LENGTH	32.92	36.21	27.00	42.00	42.00	55.99
Ξ	NUMBER OF PRECIPITATOR BOXES	2	2	2	2	2	2
12	NO. OF CELLS IN WIDTH	2	4	9	9	9	4
13	PLATE LENGTH EACH ELECTRICAL FIELD	8.23	9.05	6.75	10.50	10.50	11.20
13	PLATE SPACING (INCH)	12	12	12	6	6	12
14	NUMBER OF GAS PASSAGES (EACH BOX)	72	96	84	192	192	92
15	TOTAL NUMBER OF PLATES (ALL BOXES)	584	9//	089	1,544	1,544	744
16	EFFECTIVE PRECIPITATOR WIDTH ( ALL Boxes)	144	192	168	288	288	184
17	PLATE AREA (BOTH SIDES)	543	634	405	756	756	1,097
<u>&amp;</u>	PRECIPITATOR WIDTH CASING TO CASING	168.5	168.5	168.5	168.5	168.5	168.5
19	TOTAL PLATE AREA, ALL CHAMBERS	312,840	486,640	272,160	1,161,216	1,161,216	1,009,604
50	TOTAL NO. OF T/R SETS	16	16	16	16	16	40
7	PLATE AREA EACH T/R SET	19,553	30,415	17,010	72,576	72,576	25,240
22	TOTAL FLUE GAS VOLUME (acfm)	1,670,000	2,100,000	1,900,000	3,395,652	3,395,652	2,275,000
23	GAS TEMPERATURE	300	320	325	750	750	320
24	GAS VELOCITY, FT/SEC	5.86	5.21	6.28	5.46	5.46	4.21
25	RESIDENCE TIME, SEC	5.62	6.95	4.30	7.69	7.69	13.31
56	SPECIFIC COLLECTION AREA @ 12" SPACING (SCA)	187	232	143	256	256	444
27	SPECIFIC COLLECTION AREA @ 9" SPACING (SCA)	250	309	191	342	342	592

### SARGENT & LUNDY

### LOUISVILLE GAS & ELECTRIC, VARIOUS UNITS ELECTROSTATIC PRECIPITATOR DESIGN DATA (2005)

LINE NO.	DESCRIPTION	MILL CREEK #3	MILL CREEK # 4	GHENT #1	GHENT #3	GHENT # 4	TRIMBLE COUNTY # 1
į							1
/7	HEALINPULIO BOILER (BTU/HR)	4.18E+09	4.86E+09	5.13E+09	5.13E+09	5.13E+09	5.17E+09
28	COAL HHV (BTU/LB)	10,906	10,906	11,749	11,749	11,749	10,640
29	ASH IN COAL (%)	12.60	12.60	11.70	11.70	11.70	14.00
30	COAL FEED RATE (TONS/HR)	191	223	218	218	218	243
31	FLY ASH CARRY OVER (%)	85	85	85	85	85	85
32	FLY ASH INLET GRAIN LOADING (GR/ ACF)	2.86	2.65	2.67	1.49	1.49	2.97
33	SORBENT GRAIN LOADING (GR/ ACF)	0.004	0.003	0.007	0.004	0.004	0.01
34	TOTAL INLET GRAIN LOADING (GR/ ACF)	2.87	2.65	2.67	1.50	1.50	2.98
35	FLY ASH INLET LOADING (LB/MMBTU)	9.82	9.82	8.46	8.46	8.46	11.18
-	NOTES:						
- , .	1) The estimated plate area for Ghent 3 and 4 Electrostatic Precipitators requires confirmation, will be revised after confirmation from LG&E.	recipitators requ	res confirmation,	will be revised a	ıfter confirmation	from LG&E.	
	2) The sorbent grain loading is based on worst case scenario of using Hydrated lime injection (Option 1).	o of using Hydrate	ed lime injection (	Option 1).			

REV.1-012706

						Louis	ville Gas & E	lectric								E	Estimate No.:	21998B
Sargent 8	& Lundy <sup>LLC</sup>						<b>Ghent Unit 1</b>										Project No.:	10584-022
Chica	go					SO3	Mitigation Sy										Date	12/20/2005
,							n 1 - Hydrate						<b> </b>			:	Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote			-			agnitude Co			<u> </u>	,						Run Date:	1/27/2006
	Cost Type: Est = Estillated, Did = Velidor quote	A series of the					ONFIDENTIA		Wage Rates	Pacad on:		1	Louisville	KV	<u> </u>		Preparer:	-
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<u>Item No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
															Apple 30.00			
	DUCTWORK MODIFICATIONS			1														:
	MODIFY GAS DUCT TO ACCEPT INJECTION			<u> </u>									,					
	NOZZLES				<u> </u>							, '						
	DUCTWORK MODS		Est	1	TN	2,625.00	2,625		35.00	35		FLDU	89.66	3,138			<u></u>	5,80
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40	1,680		0.27	54	54	DINS	59.32	3,203			<b></b>	4,90
				<u> </u>	<u> </u>					ļ		ļ	<del> </del>		ļ		<b> </b>	
DW-2	DUCTWORK SUPPORT STRUCTURES				TAI	1 000 00	9,450		16.00	80	90	STST	86.46	6,917	ļ		<b></b>	16,40
	STRUCTURAL STEEL ACCESS & GALLERIES		Est Est	5 400	TN SF	1,890.00 31.50	9,450 12,600		0.40	160	160	GALL	71.2	11,392				24,00
	AUUESS & UALLERIES		ESI	400	31-	31.50	12,000		0.40	100	100		, , , 2	11,002			j b	24,00
DW-4	DUCTWORK SUBTOTAL						26,355				329			24,650			,	51,10
	Injection System												7					7
J ·	FOUNDMENT/COMPONENTS				<u> </u>													
lan-	EQUIPMENT/COMPONENTS	450 h l.		<b>-</b>		55 105 00	275,625		105.00	525	525	PUMP	65.83	34,561				310,20
	Air Blowers	150 hp each	Est	5 3	EA EA	55,125.00 10,500.00	31,500		30.00	90		TANK	65.78	5,920			-	37,40
	VFD Rotary Feeder	3 hp - Stainless Steel 2,937,600 lb full - 19,615 ft <sup>3</sup> - D=15.1' - H=82.0' - CS Silo - SS	Est	3	L EA	10,500.00	31,500		30.00	90	90	IANIX	03.70	5,320				
	Long-Term Storage Silo - 1 Unit (10 Days)	Hopper 293,760 lb full - 1,920 ft <sup>3</sup> -	Est	1	EA	797,000.00	797,000		2545.52	2,546	2,546	TANK	65.78	167,444				964,40
43.3.4	Chart Tarra Characa Cita (04 Hayra)	D=8.5' - H=38.0' - CS Silo - SS	Est	1	EA	200,000.00	200,000	4	764.00	764	764	TANK	65.78	50,256			1.	250,30
	Short-Term Storage Silo - (24 Hours) Injection Manifold (2 Qty)	Hopper Stainless Steel	Est	2	EA	10,500.00			240.00		480	MECH	66.86	32,093				53,10
	Injection Nozzles (50 Qty)	Stainless Steel	Est	1 1	LT	10,500.00			240.00		240	MECH						26,50
	System Piping	Statilloco Groot						<u>anning an an airig ann an an</u>										
	8" - CS	Includes fitting allowance	Est	350	LF	18.48	6,468	8	0.46	161		SPNG	70.4	11,334				17,80
	Piping Insulation & Lagging	Secretary Secret	Est	0	LF	6.62			0.14	0	0	INSUL	53.39	0				
	Heat Tracing		Est	0	LF	0.00	0		0.00	0	0	WIRE	69.06	0				
	Valves	Allowance	Est	1	LS	1,050.00	1,050		24.75	25	25	SPNG	70.4	1,742		***************************************	<u> </u>	2,80
	Supply Piping													·			<b></b> '	
	Water Supply	Allowance	Est	0	LS	840.00			100.00	0	0	SPNG	70.4	0			<b></b> '	
	Air Supply	Allowance	Est	0	LS	525.00			80.00	0	0	SPNG	70.4	0			<b> </b>	
	Piping Supports	Allowance	Est	11	LS	1,575.00			60.00	60		SPNG	70.4	4,224			<b></b>	5,80
11.1	Piping Rack	Allowance	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,80
	FOUNDATIONS	INCLUDES EXCAVATION &		F0 =	CY	157.50	7,875		7.00	350	350	CONP	52.91	18,519			1	26,40
IS-2	FOUNDATIONS STRUCTURAL STEEL	BACKFILL	Est Est	50 10	TN	2,200.00	22,000	8 ' 1	16.00	160	160	STST	86.46	13,834				35,80
IS-3 IS-4	STRUCTURAL STEEL AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	2,200	LF	10.00	22,000		0.52	1,144	1.144	PILE	82.81	94,735				116,70
10-4	AUGEN UND FILES (120 TON CAPACITY)	150 K LONG	LUI	2,200	<del></del>	10.00	22,000	A		,,,,,	,			,				
IS-5	IS SYSTEM SUBTOTAL						1,418,593				6,704			464,542				1,883,00
	MATERIAL UNLOADING SYSTEM																	
<del> / ]</del>	TRUCK DELIVERY  AUXILIARY POWER SUPPLY  SYSTEM/I&C	INCLUDED IN SILO	Est	0	Set	315,000.00	0		1753.67	0	0	SPNG	70.4	0	#			
	POWER SOURCE																	Karamanan da karaman da karamanan da karaman da karamanan da karaman da karamanan da karaman da karamanan da karaman da karamanan da karaman da karamanan da karamanan da karaman da

						Louis	ville Gas & E	lectric		T						E	stimate No.:	21998B
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	Cost Type: Est = Estimated, Bid = Vendor quote			La series de la companya della companya della companya de la companya de la companya della compa	<u> </u>		ONFIDENTIA	agnitude Cost Estimate		Based on:			Louisville	KY			Preparer:	<del> </del>
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<u>Item No</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
	480V SWITCHGEAR	Double Ended Unit Substation with (2) 2MVA, 6.9-480V XFMR's	Est	1 10 100	EA EA	575,000.00 63,000.00			500.00 100.00	500 100	500	EHEA EHEA	53.92 53.92	2 26,960 2 5,392				602,00 68,40
	New Breaker at Existing 6900V Switchgear		Est Est	1 2	EA	42,000.00			200.00	400		EHEA	53.92					105,60
	MCC Misc Electrical Equipment & Controls		Est	1	LS	60,900.00			300.00	300	300	EHEA	53.92					77,10
AP-2	GROUNDING																	
	Cable - 500kcmil GND		Est	2,000	LF CA	2.10			0.05	100	100	WIRE PILE	69.06 82.81				,	11,10 6,40
-	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	FILE	02.81	3,9/5				6,40
AP-3	CABLE		<u> </u>						1									
<u> </u>	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60		Routed in 5" Conduit	0.69	0	0	WIRE	69.06					
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.70		Routed in 3" Conduit	0.69	173	173	WIRE	69.06	11,913				15,60
	Power Cables for 480V Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.40	0	Routed in 2" Conduit Routed in 1-1/2"	0.35	0	0	WIRE	69.06	0				
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30	0	Conduit	0.52	0		WIRE	69.06	6				
<b> </b>	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #2/0, 600V	Est	150	LF	0.76	113	Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06					70
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	150	LF	1.58		Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06					80
	Power Cables from MCC to Loads - 50 HP	3/C #4, 600V	Est	150	LF	2.10	315	Routed in 1-1/2" Conduit Routed in 1-1/2"	0.09	14	14	WIRE	69.06	932				1,20
	Power Cables from MCC to Loads - 100HP	3/C #4/0, 600V	Est	150	LF	9.45	1.418	Conduit	0.50	75	75	WIRE	69.06	5,180				6,60
	Power Cables from MCC to Loads - 150HP	3/C #350, 600V	Est	300	LF	10.50	3,150	Routed in 2" Conduit	0.69	207	207	WIRE	69.06	14,295				17,40
	Control Cables - Pumps	5/C #14, 600V	Est	150	LF	0.67	101	Routed in 3/4" Conduit	0.03	5	5	WIRE	69.06	332				40
	Control Cables TD C-4-	7/C #14, 600V	Est	0	LF	0.81		Routed in 1-1/2" Conduit	0.04		n	WIRE	69.06					
	Control Cables - TR Sets Instrumentation Cables	7/C #14, 600V 2 PR #16 SHLD	Est	750	LF	0.81		Routed in 3/4" Conduit		24	24	WIRE	69.06					1,80
	Data Highway Cable		Est	1,000	ĹF	3.15	3,150	Routed in 3/4" Conduit	0.03		32	WIRE	69.06	2,210				5,40
AD 4	DACEWAY				1													
AP-4	RACEWAY 3/4" Conduit		Est	2,300	<del> </del> F	2.06	4,733		0.19	446	446	ECND	49.67	22,163				26,90
	1-1/2" Conduit		Est	300	LF	4.67	1,402		0.28	85	85	ECND	49.67	4,232				5,60
	2" Conduit		Est	300	LF	6.25	1,874		0.35	106	106	ECND	49.67					7,10
	3" Conduit		Est	900	LF	13.13			0.65 1.13	581	581	ECND ECND	49.67 49.67					40,60
	5" Conduit		Est	0	LF	38.33	0		1.13	U	0	ECIND	49.07					
AP-5	DCS SYSTEM ADDITIONS Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,700
													·					
AP-8	DCS PROGRAMMING/INTERFACE		Ect	1 1	EA	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187				3,80
	Interface Hardware Programming /Interface		Est Est	1	LT	5,250.00			0.00	0		WIRE	69.06					5,30
AP-9	LIGHTING ALLOWANCE		Est	1	LT	10,500.00	10,500		100.00	100	100	INEL	60.02	6,002				16,50
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						871,538				3,370			188,413				1,060,00
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE																

						Louis	ville Gas & E	lectric		1	T .		T	T		E	stimate No.:	21998B
Sargent	& Lundy <sup>LLC</sup>						Ghent Unit 1						1				Project No.:	
Chica			<b> </b>		<del> </del>		Mitigation S					<del> </del>	<del>                                     </del>					12/20/2005
,		*	1	<b> </b>			n 1 - Hydrate								<del> </del>		Rev Date	
1	Cost Type: Est = Estimated, Bid = Vendor quote										l	-					<del> </del>	
			1. The 1. P. J.		<del>                                     </del>		Order of Magnitude Cost Estimate -CONFIDENTIAL- Wage Rates Based on:							NV			Run Date: 1/27/2006 Preparer:	
					<del> </del>		ON IDENTIF	\	Labor Produ				Louisville	; KI			Reviewer:	
			<del> </del>						Laborrious	July -							neviewei.	•
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract s	DOR (Furnish)	DOR (Install)	Total Projected Cos
	MISCELLANEOUS	NONE																4
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,150.00	3,150		1170.00	1,170	1,170	PNTR	55.58	65,029				68,20
MISC-2	ROADWORK	- 155 - 155	Est	0	LS	36,750.00	0		380.00	0	C	PBIT	62.43					
	STORM DRAINAGE		Est	0	LS	7,350.00	0		300.00	0		YDRN		0				
MISC-4				-					1				1,					
	BLOWER HOUSE																	
	BLOWER ROUSE	INCLUDES EXCAVATION &	<u> </u>	<b>-</b>														
-	FOUNDATIONS PREFAB BLDG. 15'X20'	BACKFILL	Est Est	25 1	CY LS	157.50 38,000.00	3,938 38,000		7.00 130.00	175 130	175 130	CONP STST	52.91 86.46	9,259 11,240				13,200 49,200
MISC-5	CFD MODEL STUDY		Est	1	LS	30,000.00	30,000		40.00	40	40	STST	86.46	3,458				33,50
-6	TANK BERM		Est	1	LS	0.00	0		260.00	260	260	STST	86.46	22,480				22,50
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	0.00	0		60.00	60	60	STST	86.46	5,188				5,20
MISC-5	MISC. SUBTOTAL						75,088				1,835		- 2-22	116,653				191,80
				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1														
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							150,000				150,00
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			150,000				150,00
	SUBTOTAL				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		2,391,574	kata ang katalan makamban da katalan katalan pangan ang makalan na makalan na makalan na makalan na makalan na Makalan katalan na makalan na mak		0	12,238			944,258				3,335,900
	Craft Support During Startup	At 3% of Total Manhours									367	MECH	66.86	24,548				24,50
	Allowance for Premium Time Labor Productivity Loss Due To Overtime					- Company of the Comp												Not Included
	Per Diem Expense		·				***************************************											Not Included Not Included
	Project Wrap (Efficacy) Insurance																	Not included
	Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs																166,800
	Erection Contractor's Profit	At 8% of Material and Labor Costs					i romani estadorom in circuito di Contral ant a conse a concentramente del				**************************************		113					266,900
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																Included w\Equipment Costs Included
	Special Tools	Included w\Equipment Costs						et estate es										w\Equipment Costs
	Consumables	At 0.5% of Equipment/Material																12,000
	Freight To Site	At 4.5% of Equipment/Material Cost																107,600
i	Taxes - Sales/Use/VAT/Business/Etc.				1													Not Included

	The state of the s					Louis	ville Gas & E	lectric									Estimate No.:	21998B
Sargent	& Lundy LLC						<b>Ghent Unit 1</b>										Project No.	10584-022
Chica	ago					SO3	Mitigation Sy	/stem				<u> </u>			1		: 12/20/2005	
		ertin likeviini erenti	<b></b>	1			1 - Hydrated Lime											1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co								-			1/27/2006
			1.2.	No. 10 and 10 an	<del> </del>		ONFIDENTIA		Wage Rates	Passal and				LOV.				
					<del></del>		ONFIDENTIA	<b>1L-</b>			<u> </u>	Louisville, KY				ļ	Preparer	
					4				Labor Productivity =				1				Reviewer	
Item No.	. <u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>S</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
	SUBTOTAL INSTALLED COST										12,606			968,806				3,913,70
																	1	,,,,,,
ENGINEE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team	<u> </u>							C	)							391,37
CTADTU	TING, MODELING, ETC.		<b>_</b>	ļ							)							
CONTING	P, TESTING AND REAGENT (15 DAYS)	At 20% of Total			<u> </u>								~~~~					50,00
	INTERNAL COST	Furnished by Owner		1														871,00
SPARE P		T difficiled by Owner	I	<u> </u>	1				<del>-</del>		1			<u> </u>				100,00
ESCALA		Not Included	1	1												· · · · · · · · · · · · · · · · · · ·		Not Included
	ST DURING CONSTRUCTION (AFUDC)	Not Included	1	1		:												
		1.29	1					<del>*************************************</del>									<b>-</b>	
	PROJECT TOTAL:								1						<b>!</b>			5,326,07

						Louis	ville Gas & E	lectric				T	T	T		F	stimate No.:	21999B
Sargent 8	& Lundy <sup>LLC</sup>						Ghent Unit 1										Project No.:	
Chica		the Charge Carry			<u> </u>	SO3	Mitigation Sy				-	r					<del>                                     </del>	12/20/2005
							· Magnesium				<u> </u>	<del> </del>	1				Rev Date	<del> </del>
,	Cost Type: Est = Estimated, Bid = Vendor quote				<del> </del>		lagnitude Co				<del> </del>						ļ	
	7.11 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -						CONFIDENTIA		W B-1	D				101				1/27/2006
					<u> </u>		ONFIDENTIA	<b>1L-</b>	Wage Rates			ļ	Louisville	, KY			Preparer:	
			1-0-100 feet 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				-		Labor Produ	ictivity =	<del> </del>	-	1				Reviewer:	
<u>Item No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
	DUCTWORK MODIFICATIONS																	
	MODIFY GAS DUCT TO ACCEPT INJECTION													- 1.				
DW-1	NOZZLES DUCTWORK MODS		P=															
	INSULATION & LAGGING	6" THICK INSULATION	Est Est	200	TN SF	2,625.00 21.00			35.00			FLDU DINS	89.66					5,80
• • • • • • • • • • • • • • • • • • • •	INCOLATION & LAUGING	O THION INSULATION	50	200	or or	21.00	4,200		0.27	54	54	אוט	59.32	3,203				7,40
DW-4	DUCTWORK SUPPORT STRUCTURES	4.		<b>1</b>					<u> </u>	<del> </del>		l					<u> </u>	
	STRUCTURAL STEEL		Est	5	TN -	1,890.00	9,450		16.00	80	80	STST	86.46	6,917				16,40
	ACCESS & GALLERIES		Est	400	SF	31.50			0.40	160		GALL	71.2					24,00
DW-6	BOILER MODS			ļ								ļ						
DVV-6	WALL AND TUBE MODS		Est	2	TN	2,625.00	5,250		35.00	70	70	FLDU	89.66	6,276			*	11.50
	WALL AND TOBLINODS		LSI	- 4	111	2,025.00	5,250		35.00	/	70	FLDU	89.66	0,276				11,50
		·		<u> </u>						<u> </u>								
													<u> </u>					
ק-שמן	DUCTWORK SUBTOTAL						34,125				399			30,926				65,10
	Injection Cyctom																	
	Injection System				ļ				-							-		
10.4	FOLUDATATION ADOLEMTO			:				7										
IS-1	EQUIPMENT/COMPONENTS  Air Blowers				<u> </u>													***
-34	38.6	Not required	Est	3	EA	21,000.00			40.00	120		MECH	66.86	8,023				71,000
	VFD Rotary Feeder	Not required 1,617,900 lb full - 17,060 ft3 - D=26.3' - H=31.6' - CS Silo -	Est		EA	10,500.00	10,500		30.00	30	30	MECH	66.86	2,006				12,500
	Long-Term Storage Tank - 1 Unit (10 Days)	SS Hopper	Est	1	EA	151,000.00	151,000		580.00	580	580	TANK	65.78	38,152				189,200
	Short-Term Storage Silo - (24 Hours)	Not required	Est	0	EA	0.00	0		60.00	0	0	TANK	65.78					
	Air Compressors (2 Qty)	50 hp - 2 X 100% 808,320 lb full - 8,520 ft3 -	Est	2	EA	21,000.00	42,000	2	80.00	160	160	MECH	66.86	10,698				52,700
1		D=20.8' - H=25.0' - CS Silo -															1	
	Mixing Tank - 1 Unit - (24 Hours)	SS Hopper	Est	1 1	EA	76,500.00	76,500		880.00	880	880	TANK	65.78	57,886	1			134,400
	Mixing Tank Agitator (1 Qty)	20 hp - CS Shaft	Est	2	EA	21,000.00	42,000		30.00	60		MECH	66.86					46,000
		125,000 lb full - 2,000 ft3 -																.5,500
	Water Storage Tank - 1 Unit (24 Hrs)	D=13.7' - H=13.7' - CS	Est	100	EA	115,500.00	115,500		880.00	880		TANK	65.78					173,400
	Slurry/Water Pumps (6 Qty)	2 hp - CS	Est	6	EA	5,250.00	31,500		20.00	120		PUMP	65.83					39,400
	Injection Manifold (2 Qty)	Stainless Steel	Est	2	EA	10,500.00			240.00	480	480	MECH	66.86	32,093				53,100
	Dual Fluid Injection Nozzles (20 Qty) System Piping	Stainless Steel	Est	<b>1</b> 0.00	LT	42,000.00	42,000	i s	96.00	96	96	MECH	66.86	6,419				48,400
	1" - CS	Includes fitting allowance	Eot	200	LF	0.07	000		1	49	49	SPNG	70.4	0.404				
			Est	300		2.27	680		0.16				70.4	3,464				4,100
	4" - CS	Includes fitting allowance	Est	50 350	LF	9.28			0.33	17	17		70.4	1,162				1,600
	Piping Insulation & Lagging Heat Tracing		Est Est	350	LF LF	2.99 21.00	1,047 7,350		0.08 0.31	26 109	109	INSUL WIRE	53.39 69.06	1,402 7,493				2,400 14,800
	Valves	Allowance	Est	1	LS	1,050.00	1,050		24.75	25		SPNG	70.4	7,493 1,742				2,800
<del></del>	Supply Piping	MIOWALIOG	LOI	1 22	LO	1,050.00	1,050		24./5	20	25	SPING	70.4	1,742				2,800
	Water Supply	Allowance	Est	200	LS	840.00	168,000		100.00	20,000	20,000	SPNG	70.4	1,408,000	1			1,576,000
	Air Supply	Allowance	Est	200	LS	525.00			80.00	16,000	16,000		70.4	1,126,400			. ,	1,231,400
<del>_</del>	Piping Supports	Allowance	Est	1	LS	2,100.00	2,100		40.00	40		SPNG	70.4	2,816				4,900
	Piping Rack	Allowance	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
		INCLUDES EXCAVATION &							"									30,000
S-2		BACKFILL	Est	110	CY	157.50	17,325		7.00	770	770	CONP	52.91	40,741				58,100

· [	1		T		,	Louis	ville Gas & E	lectric	, 5-2		1	T					Estimate No.	· 21999R
Sargent	& Lundy <sup>LLC</sup>		<del>                                     </del>		+	Louis	Ghent Unit 1		- 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10								·	: 10584-022
Chic						SO3	Mitigation S										<u> </u>	: 12/20/2005
1		e gerg, parijng entr			<u> </u>		- Magnesium										Rev Date	
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	lagnitude Co	st Estimate						4			Run Date	: 1/27/2006
			f figures where	- Jacque (1986), 1 (197			CONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer	:
			1 2 4 / 25 - 1 4 1						Labor Produ	ctivity =			1				Reviewer	
<b></b>					-													
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
IS-3	STRUCTURAL STEEL		Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,80
IS-4	AUGER CAST PILES (120 TON CAPACITY)	90 ft LONG	Est	0	LF	10.00	0 0		0.52	0	1	PILE	82.81					
									0.02				02.01					
IS-5	IS SYSTEM SUBTOTAL						942,017				40,761			2,845,961				3,787,80
	MATERIAL UNLOADING SYSTEM																	
ASH-1	TRUCK UNLOADING SYSTEM		Est	1 1	Set	105,000.00	105,000		1254.00	1,254	1,254	SPNG	70.4	88,282				193,30
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL				<u> </u>		105,000				1,254			88,282				193,30
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE		<b> </b>														igni yang salah	
		Double Ended Unit Substation with (2) 1 MVA,																
	SWITCHGEAR	6.9-480V XFMR's	Est	1 fpt.	EA	460,000.00			500.00	500	500	EHEA	53.92	26,960	n un us no mestro			487,00
	New Breaker at Existing 13.2kV Switchgear MCC		Est Est	1 2	EA EA	63,000.00 42,000.00	63,000 84,000	*	100.00 200.00	100 400	100 400		53.92	21,568				63,00 105,60
	Misc Electrical Equipment & Controls		Est	1	LS	8,400.00	8,400		300.00	300		EHEA	53.92					24,60
AP-2	GROUNDING										0							
	Cable - 500kcmil GND Grounding Rod	- Ap 12.00 - 4-12 - 24.00	Est Est	2,000 12	LF EA	2.10 199.50	4,200 2,394		0.05 4.00	100 48		WIRE	69.06 82.81	6,906 3,975				11,10 6,40
40.0	CABLE																	
AP-3	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60	0	Routed in 5" Conduit	0.69			WIRE	69.06	_				
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.70	3,675	Routed in 3" Conduit	0.69	173	173	WIRE	09.00	<u> </u>				
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.40	0	Routed in 2" Conduit Routed in 1-1/2"	0.35	0	0	WIRE						
1.50	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30	0	Conduit	0.52	o	0	WIRE	69.06					
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	300	LF	0.76	227	Routed in 3/4" Conduit	0.05	16	16	WIRE	69.06	1,098				1,300
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	150	LF	1.58	236	Routed in 3/4" Conduit Routed in 1-1/2"	0.05	8	8	WIRE	69.06	549				800
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	0	LF	2.12	0	Conduit Routed in 1-1/2"	0.09	0	0	WIRE				***		
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V	Est	100	LF	2.67		Conduit	0.35	35	35	WIRE						
	Power Cables from MCC to Loads - 60HP Control Cables - Pumps	3/C #2, 600V 5/C #14, 600V	Est Est	50 300	LF LF	3.58 0.67	202	Routed in 2" Conduit Routed in 3/4" Conduit	0.35 0.03	18 10	18 10	WIRE WIRE	69.06 69.06	1,209 <del>6</del> 63				1,400 900
Est	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81		Routed in 1-1/2" Conduit	0.04	0	O	WIRE	69.06	0				
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25	189	Routed in 3/4" Conduit	0.03	24	24	WIRE	69.06	1,657		,,	,	1,800
	Data Highway Cable		Est	1,000	LF	3.15	3,150	Routed in 3/4" Conduit	0.03	32	32	WIRE						
	RACEWAY																	
	3/4" Conduit		Est	2,500	LF	2.06			0.19	485	485	ECND						
New York	1-1/2" Conduit 2" Conduit		Est Est	100 50	LF LF	4.67 6.25			0.28 0.35	28 18	28 18	ECND ECND						
West .	3" Conduit		Est	250	LF	13.13	3,281		0.65	161	161	ECND						
-	5" Conduit		Est	0	LF	38.33			1.13	0	0	ECND						

						Louis	ville Gas & E	lectric								Æ	Estimate No.:	21999B
Sargent &	Lundy LLC		· · · · · · · · · · · · · · · · · · ·				Ghent Unit 1					10000					Project No.:	<del></del>
hicag							Mitigation Sy										ļ	12/20/2005
				41.000 -000 -00			Magnesium										<del> </del>	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote				95 (100 tol 4.)		agnitude Co: ONFIDENTI <i>A</i>		Wage Rates	Based on:			Louisville	. KY			Preparer	
							ONTIDENTIA		Labor Produ				1				Reviewer	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
											- c							
	DCS SYSTEM ADDITIONS Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40 40	EHEA						
AP-8	DCS PROGRAMMING/INTERFACE						0.005		20.00	20	0	EHEC						
	Interface Hardware		Est Est	1 1	EA LT	2,625.00 5,250.00	2,625 5,250		20.00 0.00	20 0	20	WIRE	69.06	0				5,300
	Programming /Interface								100.00	100	100	INEL						
AP-9	LIGHTING ALLOWANCE		Est		LT	10,500.00	10,500		100.00	100	100	11.4						
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						689,199				2,615			80,761				709,200
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE																
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	5,250.00	5,250		1550.00	1,550	1,550	PNTR	55.58	86,149				91,400
MISC-2	ROADWORK	Not Required	Est	0	LS	36,750.00	.0		380.00	0	0	PBIT	62.43	0			n en word also na en english	
MISC-3	STORM DRAINAGE		Est		LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4	OTHER												emente en la					
	PUMP HOUSE 15' X 20'	INCLUDES EXCAVATION &		05	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,200
	FOUNDATIONS	BACKFILL	Est	25														
	PREFAB BLDG.		Est	1	LS	38,000.00	38,000		130.00	130	130	STST	86.46					49,200
MISC-5	CFD MODEL STUDY		Est	1	LS	100,000.00	100,000		40.00	40	40	STST	86.46	3,458				103,500
MISC-6	TANK BERM		Est	1	LS	76,000.00	76,000		260.00	260	260	STST	86.46	22,480				98,500
	SOFT WATER SUPPLY SYSTEM		Est	1	LS	34,000.00	34,000		60.00	60	60	STST	86.46	5,188				39,200
1	MISC. SUBTOTAL						54,538				2,155	- ,		122,239				176,700
IVIISU-5	MIGO. GODI OTAL									· .								
	GENERAL SUPPORT																	
<b>-</b> -	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
GS-2	GENERAL SUPPORT SUBTOTAL						0	и.			0			100,000				100,000
1	SUBTOTAL						2,034,879			0	47,544			3,299,294				5,273,300

	110					Louis	ville Gas & E						:				Estimate No.	: 21999B
	& Lundy <sup>LLC</sup>						Ghent Unit										Project No.	.: 10584-022
Chic	ago					SO3	Mitigation S	/stem									Date	: 12/20/2005
						Option 2	- Magnesium	Hydroxide									Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	lagnitude Co	st Estimate					<b> </b>				<del> </del>	: 1/27/2006
				1 12 13 14	1		CONFIDENTIA		Wage Rates	Based on			Louisville	KV				<del></del>
							JOHN IDENTIA	/L-	Labor Produ				Louisville	, NT			Preparer	
									Labor Produ	cuvity =							Reviewer	3
Item No	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
	Craft Support During Startup	At 3% of Total Manhours			:						1 426	MECH	66.86	05.064				05.46
	Allowance for Premium Time Labor	. C. C. Total Manifolio									1,420	MECH	00.00	95,364			-	95,40 Not Included
	Productivity Loss Due To Overtime				<b> </b>													Not included
	Per Diem Expense								1							<u></u>	<b> </b>	Not Included
	Project Wrap (Efficacy) Insurance Erection Contractor's General & Administrative																	Not Included
	Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs																263,70
	Erection Contractor's Profit	At 8% of Material and Labor Costs							-									421,90
					1												<del> </del>	Included
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs						i .										w\Equipment
			and the second s															Costs Included
	Special Tools	Included w\Equipment Costs									,	1						w\Equipment
		At 0.5% of																Costs
	Consumables	Equipment/Material Cost At 4.5% of																10,20
1	Freight To Site	Equipment/Material Cost			ľ													
	Taxes - Sales/Use/VAT/Business/Etc.	Equipment/waterial Cost									-							91,60
	Construction Utilities (Elect, Water, etc.) During																	Not Included
		Furnished by Owner																By Owner
	SUBTOTAL INSTALLED COST									0	48,970			3,394,658				6,156,10
FNGINE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team																045.00
	TING, MODELING, ETC.	. cc.iod by t toject tourn								0								615,60
STARTU	P, TESTING AND REAGENT (15 DAYS)					<del>- Mariana da Mariana da Mariana da Mariana</del>				0								50,000
CONTING	GENCY	At 20% of Total								Ö								1,364,300
	NTERNAL COST	To Be Furnished by Owner								0								100,000
SPARE F										0						**		Not Included
ESCALA <sup>*</sup>		Not Included																
INTERES	ST DURING CONSTRUCTION (AFUDC)	Not Included																
	PROJECT TOTAL:							· · ·		<u></u>								8,286,00

	847 LANGERS (V.)			T		Louis	ville Gas & E	lectric		1		T	T	T	T	1	Estimate No.	22000B
Sargent	& Lundy <sup>LLC</sup>						Ghent Unit					<u> </u>	<del> </del>				Project No.	
Chica						SO3	Mitigation S						1		-		+	: 12/20/2005
				1			tion 3 - Soda										Rev Date	1/27/2006
1	Cost Type: Est = Estimated, Bid = Vendor quote			1			lagnitude Co										Run Date	: 1/27/2006
			Artike a			<del></del>	ONFIDENTIA	<del>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</del>	Wage Rates	Based on:			Louisville	e, KY			Preparer	:
			et in endis						Labor Produ				-	ĺ			Reviewer	<del></del>
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction Erection Cost	Sub- Contract <u>S</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
	DUCTWORK MODIFICATIONS																	
DW-1	MODIFY GAS DUCT TO ACCEPT INJECTION NOZZLES																	
	DUCTWORK MODS		Est	1	TN	2,625.00	2,625		35.00		35		89.66					5,80
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40	1,680		0.27	54	54	DINS	59.32	3,203				4,90
DW-4	DUCTWORK SUPPORT STRUCTURES		· · · · · · · · · · · · · · · · · · ·	<b> </b>	<b> </b>								<u> </u>					
- TT - T	STRUCTURAL STEEL		Est	5	TN	1,890.00	9,450		16.00	80	80	STST	86.46	6,917				16,40
4 3	ACCESS & GALLERIES		Est	400	SF	31.50	12,600		0.40	160		GALL	71.2					24,00
DW-9	DUCTWORK SUBTOTAL						26,355				329			24,650				51,10
	Injection System		-															
	EQUIPMENT/COMPONENTS																	
	Process Technology Package (PTP) by URS		Est	1	EA	1,800,000.00	1,800,000		20.00	20	20	PUMP	65.83	1,317,				1,801,30
	Dumps (6 Oh)	4 - CS internals - 2.0 HP / 4 -		1	-	0.100.00			20.00			DUMB	CE 00					
	Pumps (6 Qty)	SS internals - 1.0 HP 420,250 lb full - 5,180 ft <sup>3</sup> -	Est	0	EA	2,100.00	0		20.00	U	0	PUMP	65.83	0	To the special			
*	Soda Ash Solution Tank - 1 Unit (10 Days)	D=17.6' - H=21.2' - SS 309,312 lb full - 4,957 ft <sup>3</sup> -	Est	. 1	EA	133,000.00	133,000		535.21	535	535	TANK	65.78	35,206				168,20
	Soft H₂O Storage Tank - 1 Unit - (24 Hours)	D=18.48' - H=18.48' - CS	Est	1	EA	129,000.00	129,000		489.52	490		TANK	65.78				4 1 2 3 4 4	161,20
	Agitator (1 Qty)	SS Shaft - 20 HP	Est	1	EA	21,000.00	21,000		30.00	30	30	MECH	66.86	2,006				23,000
	Air Compressors (2 Qty) Injection Manifold (2 Qty)	2 x 100% - 50 HP Stainless Steel	Est Est	0	EA EA	21,000.00 10,500.00	42,000		80.00 240.00	160	160	MECH	66.86 66.86	10,698				52,70
	Dual Fluid Injection Nozzles (100 Qty)	Stainless Steel	Est	0	LT	21,000.00	0		480.00	0	0	MECH MECH	66.86	0				
	System Piping	L=250' - D=4" - SS / L=50' - D=4" - CS / L=50' - D=2" - SS																
	6" - SS 6" - CS	Includes fitting allowance	Est	250	LF	30.61			0.42 0.42	105 21		SPNG SPNG	70.4 70.4					15,000
	4" - SS	Includes fitting allowance	Est	50	LF LF	11.89			0.42	17		SPNG	70.4 70.4					2,100
	4" - SS Piping Insulation & Lagging	Includes fitting allowance	Est Est	50 350	LF LF	24.89 9.14	1,244 3,197		0.33	60	17	INISHI	70.4 53.39					2,400 6,400
	Heat Tracing	.A	Est	350	LF	21.00	7,350		0.17	109	109	INSUL WIRE	69.06					14,800
	Valves	Allowance	Est	1	LS	2,520.00	2,520	,	48.00	48	48	SPNG	70.4					5,900
	Supply Piping		3															
	Water Supply	Allowance	Est	1	LS	840.00	840		100.00	100		SPNG	70.4					7,900
	Air Supply	Allowance	Est	1 1	LS	525.00	525		80.00	80		SPNG	70.4		: .	***************************************		6,200
	Piping Supports Piping Rack	Allowance Allowance	Est Est	10	LS TN	2,940.00 2,200.00	2,940 22,000		112.00 16.00	112 160	112	SPNG STST	70.4 86.46	7,885 13,834				10,800 35,800
	приупаск	INCLUDES EXCAVATION &	⊏Əl	10	114	2,200.00	22,000		10.00	100	100	0101	30.40	10,004				35,600
S-2	FOUNDATIONS	BACKFILL	Est	75	CY	157.50	11,813		7.00	525	525	CONP	52.91	27,778				39,600
-	STRUCTURAL STEEL		Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
	AUGER CAST PILES (125 TON CAPACITY)	100 ft LONG	Est	0	LF	10.00	0		0.52	0	0	PILE	82.81	0	-			(
S-3	ROYALTY FEE	0	Est	0	LF	1-								ol		AP.A.		(

						Louis	ville Gas & E	ectric								E	stimate No.	: 22000B
Sargent 8	k Lundy <sup>LLC</sup>			1			<b>Ghent Unit 1</b>						i.				Project No.	: 10584-022
Chica		No. 15 Table 199	<b> </b>	<del> </del>	-	<del></del>	Mitigation Sy				1							: 12/20/2005
				1			tion 3 - Soda		-		1						<del> </del>	1/27/2006
	Cont. Total California Did Monday works		-	<del> </del>	-												-	<u> </u>
	Cost Type: Est = Estimated, Bid = Vendor quote				ļ		lagnitude Co			<u> </u>							<del> </del>	: 1/27/2006
				a ka a sa		-C	ONFIDENTIA	AL-	Wage Rates				Louisville	, KY			Preparer	:
									Labor Produ	ctivity =			1			· · · · · · · · · · · · · · · · · · ·	Reviewer	:
					ļ													
<u>Item No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Co</u>
IS-4	IS SYSTEM SUBTOTAL					for the second	2,207,675		21		2,730			181,509				2,389,1
	MATERIAL UNLOADING SYSTEM										***************************************							
ASH-1	TRUCK UNLOADING SYSTEM		Est	1	Set	105,000.00	105,000		1254.00	1,254	1,254	SPNG	70.4	88,282				193,3
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL						105,000				1,254			88,282				193,3
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE																	
		Double Ended Unit Substation with (2) 1MVA,				400 000 00	400.000		500.00									
	SWITCHGEAR	6.9-480V XFMR's	Est	1 1	EA EA	460,000.00 63,000.00	460,000 63,000		500.00 100.00	500 100	500	EHEA EHEA	53.92 53.92	26,960 5,392				487,0
	New Breaker at Existing 13.2kV Switchgear MCC		Est Est	2	EA	42,000.00	84,000		200.00	400	100 400		53.92	21,568				68,40 105,60
	Misc Electrical Equipment & Controls		Est	1 1	LS	8,400.00	8,400		300.00	300			53.92	16,176				24,60
AP-2	GROUNDING			1														
	Cable - 500kcmil GND		Est	2,000	LF	2.10	4,200		0.05	100	100	WIRE	69.06	6,906				11,10
	Grounding Rod	(1/2 / 3/2 · )	Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,4
AP-3	CABLE																	
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60	0	Routed in 5" Conduit	0.69	0		WIRE	69.06	0				
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.70		Routed in 3" Conduit	0.69	173		WIRE	69.06	11,913			4 1 44	15,60
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF_	8.40		Routed in 2" Conduit	0.35	0	0	WIRE	69.06	0				
			١ ـ .					Routed in 1-1/2"	0.50			WUDE	00.00					
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30 0.76	151	Conduit Routed in 3/4" Conduit	0.52 0.05	- 0	- 0	WIRE	69.06 69.06	732				_
	Power Cables from MCC to Loads - 1 ~ 5HP Power Cables from MCC to Loads - 15HP	3/C #10, 600V 3/C #8, 600V	Est Est	200	LF LF	0.76 1.58		Routed in 3/4" Conduit	0.05	- 1	11	WIRE WIRE	69.06	/32				90
	Power Cables from MCC to Loads - 15HP  Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #8, 600V	Est	50	LF	2.12	106	Routed in 1-1/2" Conduit	0.03	5	5	WIRE	69.06	311				4(
								Routed in 1-1/2"										
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V	Est	100	LF_	2.67		Conduit	0.35	35	35	WIRE	69.06	2,417				2,70
	Power Cables from MCC to Loads - 60HP	3/C #2, 600V	Est	175	LF	3.58		Routed in 2" Conduit	0.35 0.03	0	0	WIRE WIRE	69.06	0				
	Control Cables - Pumps	5/C #14, 600V	Est	175	LF LF	0.67		Routed in 3/4" Conduit Routed in 1-1/2"		6			69.06	387				50
	Control Cables - TR Sets	7/C #14, 600V	Est Est	750	LF LF	0.81 0.25		Conduit Routed in 3/4" Conduit	0.04 0.03	0 24	0	WIRE WIRE	69.06 69.06	1,657				1,80
	Instrumentation Cables Data Highway Cable	2 PR #16 SHLD	Est	1,000	LF LF	3.15		Routed in 3/4" Conduit	0.03	32		WIRE	69.06	2,210				5,40
	RACEWAY																	
	3/4" Conduit		Est	2,125	LF	2.06	4,373		0.19	412		ECND	49.67	20,477				24,80
	1-1/2" Conduit		Est	150	LF	4.67	701		0.28	43		ECND	49.67	2,116				2,80
	2" Conduit		Est	0	LF	6.25	0		0.35	0		ECND	49.67	0				
	3" Conduit 5" Conduit		Est Est	250 0	LF LF	13.13 38.33	3,281 0		0.65 1.13	161 0		ECND ECND	49.67 49.67	8,009 0				11,3
	DCS SYSTEM ADDITIONS																	
	Cabinets		Est	1 1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,70
			l'		L											1.54.	100	

						Louis	ville Gas & E	lectric					T				stimate No.:	22000B
Sargent &	k Lundy <sup>LLC</sup>					·	<b>Ghent Unit 1</b>										Project No.:	10584-022
Chica	go						Mitigation Sy				,						Date:	12/20/2005
<u>,                                     </u>							tion 3 - Soda										Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co										Run Date:	1/27/2006
			de Sare			<u> </u>	ONFIDENTIA	AL-	Wage Rates				Louisville	e, KY			Preparer:	
									Labor Produ	uctivity =		-	1				Reviewer:	
tem No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
	Interface Hardware		Est	1	EA	2,625.00	2,625		20.00	) 20	20	EHEC	59.36	1 107				2 90
	Programming /Interface		Est	1	LT	5,250.00			0.00	20	20	WIRE	69.06					3,80 5,30
\P-9	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,80
					1													
P-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL					[2]- (	693,130				2,558			143,552				836,90
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE	,															
IISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,675.00	3,675		1250.00	1,250	1,250	PNTR	55.58	69,475				73,20
-2	ROADWORK		Est	0	LS	36,750.00	0		380.00	0	0	PBIT	62.43	0				
IISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,90
IISC-4	OTHER																	
	PUMP HOUSE 15' X 20'					7												
6-2	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,20
	PREFAB BLDG.		Est	1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,20
ISC-5	MISC. SUBTOTAL						52,963				1,855			105,565				158,50
											.,,,,,,,,							100,00
	GENERAL SUPPORT																	
S-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		O							100,000				100,000
S-2	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,000
	SUBTOTAL						3,085,123			0	8,727			643,559				3,728,900
	Craft Support During Startup	At 3% of Total Manhours					-,,		-	Ĭ		MECH	66.86					4
	Allowance for Premium Time Labor	At 3 /0 OF TOtal Wallifours									202	IVIEUH	00.00	17,504				17,500 Not Included
	Productivity Loss Due To Overtime Per Diem Expense		-							<u> </u>								Not Included
	Per Diem Expense Project Wrap (Efficacy) Insurance																	Not Included Not Included
	Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs								/								186,40
	Erection Contractor's Profit	At 8% of Material and Labor Costs																298,30
	Mandaton On one Desta (Olastica Toronto)																	Included w\Equipment Costs
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs			Adamin's shake a stranger		1											

						Louis	ville Gas & E	lectric			.i					Æ	Stimate No.:	. 22000B
Sargent	& Lundy LLC						<b>Ghent Unit 1</b>										Project No.	: 10584-022
hica	ago					SO3	Mitigation Sy	/stem									Date	: 12/20/2005
					2		ion 3 - Soda				1			·			Rev Date	1/27/2006
	Ocal Torrest California de Did Mandaga produ						agnitude Co										Run Date	: 1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote								Wage Rates	Dened on			Louisville	LV			Preparer	
					1	<u></u>	ONFIDENTIA	/L-					Louisville	, , , ,				
									Labor Produ	ctivity =			1				Reviewer	-
						And an an included the second		A COMPANY OF THE STATE OF THE S									<u> </u>	<u> </u>
Item No.	. <u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code		Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
																		Included
																		w\Equipment
	Special Tools	Included w\Equipment Costs		* * * * * * * * * * * * * * * * * * * *													<u> </u>	Costs
		At 0.5% of			ľ													15,400
	Consumables	Equipment/Material Cost At 4.5% of							1-44								<b> </b>	13,40
	F	Equipment/Material Cost																138,80
	Freight To Site	Equipment/Material Cost										***************************************					<b>l</b>	Not Included
	Taxes - Sales/Use/VAT/Business/Etc.			<u> </u>									<u> </u>				l	Troc moradea
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
	Construction	I umstice by Cwilet		<b>i</b>						***************************************	1							
	SUBTOTAL INSTALLED COST									0	8,988			661,062				4,385,300
	CODITOTAL INCTALLED COCI																	
ENGINE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team			and the contract of			1.,		0								438,50
PERMIT	TING, MODELING, ETC.				I control					0								1
STARTU	IP, TESTING AND REAGENT (15 DAYS)									0								50,000
CONTIN		At 20% of Total								0								974,80
	INTERNAL COST	Furnished by Owner					· 			0								100,000
	PARTS	Try								0								Not Included
ESCALA		Not Included											<u> </u>					1
	ST DURING CONSTRUCTION (AFUDC)	Not Included											<b> </b>					
	PROJECT TOTAL :	er control		<u> </u>	<u> </u>		<u> </u>		-				<b>-</b>					5,948,600

:	1					Louis	ville Gas & E	lectric	. Letter,			100				E	Estimate No.:	22001B
Sargent &	k Lundy <sup>LLC</sup>						<b>Ghent Unit 1</b>						1				Project No.	10584-022
Chica						SO3	Mitigation Sy	/stem									Date	12/20/2005
	April April Deliver						Sodium Bisi										Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate									Run Date:	1/27/2006
						-C	ONFIDENTIA	\L-	Wage Rates	Based on:			Louisville	, KY			Preparer	
			jan i Paulis						Labor Produ	ctivity =			1				Reviewer	
															, , , , , , , , , , , , , , , , , , ,			
<u>ltem No.</u>	<u>Description</u>	Scope Definition	Cost Type	<u>Quantity</u>	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod ≡1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
	DUCTWORK MODIFICATIONS																	
	MODIFY GAS DUCT TO ACCEPT INJECTION				ļ				1			ļ	<u> </u>					
DW-1	NOZZLES																	
	DUCTWORK MODS		Est	1	TN	2,625.00	2,625		35.00	35		FLDU	89.66					5,80
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40	1,680		0.27	54			59.32					4,90
DW-4	DI ICTMORK SURPORT CTRUCTURES			<u> </u>	<b></b>	<u> </u>			1			1						
DVV-4	DUCTWORK SUPPORT STRUCTURES STRUCTURAL STEEL		Est	5	TN	1,890.00	9,450		16.00	80	80	STST	86.46	6,917				16,40
	ACCESS & GALLERIES		Est	400	SF	31.50	12,600		0.40	160			71.2	11,392				24,000
DW-9	DUCTWORK SUBTOTAL						26,355				329			24,650				51,10
	Injection System																	
	EQUIPMENT/COMPONENTS																	
	Process Technology Package (URS). The cost	P&ID, Control Logic, Injection			<u> </u>													
	shown here is on a single unit basis, multi-contract	and metering pump skids,																
	or economies of scale is not included.	Proprietory injection lances	Budget	. 1	EA	1,800,000.00	1,800,000		300.00	300	300	MISC	65.83	19,749				1,819,70
	Dumana (C.Oh.)	4 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP	F-1			0.400.00	10.000		20.00	120	100	PUMP	65.83	7,900				00.50
4 (2 5 ) 1 · 1	Pumps (6 Qty)	57,000 gallons - D=19.2' -	Est	6	EA	2,100.00	12,600		20.00	120	120	PUMP	65.63	7,900		<u> </u>		20,500
194	SBS Solution Tank - 1 Unit (10 Days)	H=28.0' - SS	Est	1	EA	167,000.00	167,000		1064.00	1,064	1,064	TANK	65.78	69,990	4.2			237,000
		Included in Soft water supply						, i										
	Soft H <sub>2</sub> O Storage Tank - 1 Unit - (24 Hours)	system	Est	0	EA	0.00	21,000		489.52 30.00	0 30	0	TANK MECH	65.78 66.86	2,006				23,000
	Agitator (1 Qty) Air Compressors (2 operating, 1 standby, Cost is	SS Shaft - 20 HP	Est	1 35 3	EA	21,000.00	21,000		30.00	30	30	MECH	00.00	2,000				23,000
	divided between units 1,2,3 &4)	3 x 100% - 100 HP	Est	3	EA	225,000.00	675,000		1046.96	3,141	3,141	МЕСН	66.86	210,000				885,000
10.2	Injection Manifold (2 Qty)	Stainless Steel L=500' - D=6" - SS / L=150' -	Est	2	EA	10,500.00	21,000		240.00	480		MECH	66.86	32,093				53,100
		D=6" - CS / L=100' - D=4" -		į.														
1	System Piping	SS																
	6" - SS	Includes fitting allowance	Est	500	LF	30.61	15,304		0.42	210		SPNG	70.4					30,100
	6" - CS	Includes fitting allowance	Est	150	LF	11.89	1,783		0.42	63			70.4	4,435		***************************************		6,200
Sis 1	4" - SS	Includes fitting allowance	Est	100	LF	24.89	2,489		0.33	33		SPNG	70.4	2,323				4,800
	Piping Insulation & Lagging		Est	500 500	LF LF	9.14 21.00	4,568 10,500		0.17 0.31	85 155		INSUL WIRE	53.39 69.06	4,538 10,704				9,100 21,200
	Heat Tracing Valves	Allowance	Est Est	1	LF	7,560.00	7,560		48.00	48		SPNG	70.4	3,379				10,900
	Supply Piping	Allowarios	LOI			7,300.00	7,500	<u> </u>	70.00	70	40	5. 110	70.4	0,079				10,300
	Water Supply	Allowance	Est	1.0	LS	840.00	840		100.00	100		SPNG	70.4	7,040				7,900
STATE OF	Air Supply	Allowance	Est	1	LS	525.00	525		80.00	80		SPNG	70.4	5,632				6,200
	Piping Supports	Allowance	Est	1	LS	2,940.00	2,940		112.00	112	112	SPNG	70.4					10,800
	Piping Rack	Allowance INCLUDES EXCAVATION &	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
S-0 1	FOUNDATIONS	BACKFILL	Est	90	CY	157.50	14,175		7.00	630	630	CONP	52.91	33,333		<del></del>		47,500
/	STRUCTURAL STEEL	Allowance	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
,	AUGER CAST PILES (125 TON CAPACITY)	100 ft LONG	Est	2,200	LF	10.00	22,000		0.52	1,144	1 1//	PILE	82.81	94,735			1	116,700
S-3 /	AUGEN UND FILES (120 TON UNFAULT)	TOO IT LONG	LOL	2,200	-	10.00	22,000		0.52	1,174	1,177	1 11-1-	02.01	37,703	· · ·			110,700

						Louis	ville Gas & E			I		-	T .		1		stimate No.:	22001B
Sargent	& Lundy <sup>LLC</sup>				-		Ghent Unit										Project No.:	
Chica							Mitigation S					1	1					12/20/2005
,							Sodium Bis						1				Rev Date	
1	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate									Run Date:	1/27/2006
	The second secon	The state of the s		1 1 1 1		-c	ONFIDENTI	AL-	Wage Rates	Based on:			Louisville	e, KY			Preparer:	
							·		Labor Produ	ıctivity =			1	1			Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
IS-4	ROYALTY FEE	Not Included, \$ per MW, to be negotiated with Vendor	Est	0	LF									0				
IS-5	IS SYSTEM SUBTOTAL										7,815			538,444				3,381,30
											7,010			550,444				3,301,30
	MATERIAL UNLOADING SYSTEM																	
ASH-1	TRUCK UNLOADING SYSTEM		Est	1	Set	105,000.00	105,000		1254.00	1,254	1,254	SPNG	70.4	88,282				193,30
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL						105,000				1,254			88,282				193,30
	AUXILIARY POWER SUPPLY SYSTEM/I&C												1 1 A					
AP-1	POWER SOURCE												1			***		
	SWITCHGEAR	Double Ended Unit Substation with (2) 1 MVA, 6.9-480V XFMR's	Est	4	EA	460,000.00	460,000		500.00	500	500	EHEA	53.92	26,960				497.00
	New Breaker at Existing 13.2kV Switchgear	0.9-400V AT WITS	Est	1	EA	63,000.00	63,000		100.00	100	100		53.92	5,392				487,00 68,40
	MCC		Est	2	EA	42,000.00	84,000		200.00	400	400	EHEA	53.92	21,568		SIR COLOR		105,60
	Misc Electrical Equipment & Controls		Est	1	LS	8,400.00	8,400		300.00	300	300	EHEA	53.92	16,176				24,60
AP-2	GROUNDING																*	
	Cable - 500kcmil GND		Est	2,000	LF	2.10	4,200		0.05	100	100		69.06	6,906				11,10
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,40
AP-3	CABLE											<b> </b>				*		
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60		Routed in 5" Conduit	0.69	0	0	WIRE	69.06	0				
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.70		Routed in 3" Conduit	0.69	173	173	WIRE	69.06	11,913				15,60
<u> </u>	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.40	0	Routed in 2" Conduit Routed in 1-1/2"	0.35	0	0	WIRE	69.06	0				
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30		Conduit	0.52	0		WIRE	69.06			e a series a		
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	200	LF	0.76		Routed in 3/4" Conduit	0.05	11	11	WIRE	69.06					90
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0 1	LF	1.58	0	Routed in 3/4" Conduit Routed in 1-1/2"	0.05	0	0	WIRE	69.06	0				
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	50	LF	2.12	106	Conduit	0.09	5	5	WIRE	69.06	311				40
	Devices Cohleg from 1400 to 1 and 1 and 1	0/0 #4 00014	<b>-</b>	400				Routed in 1-1/2"										
	Power Cables from MCC to Loads - 50HP Power Cables from MCC to Loads - 60HP	3/C #4, 600V 3/C #2, 600V	Est Est	100 0	LF LF	2.67 3.58		Conduit Routed in 2" Conduit	0.35 0.35	35	35 n	WIRE	69.06 69.06	2,417 0				2,700
	Control Cables - Pumps	5/C #14, 600V	Est	175	LF	0.67		Routed in 3/4" Conduit	0.03	6		WIRE	69.06	387				500
	Control Cobles TD Cot							Routed in 1-1/2"										
	Control Cables - TR Sets Instrumentation Cables	7/C #14, 600V 2 PR #16 SHLD	Est Est	750	LF LF	0.81 0.25		Conduit Routed in 3/4" Conduit	0.04 0.03	0 24		WIRE WIRE	69.06 69.06	0 1,657				1,800
	Data Highway Cable		Est	1,000	ĹF	3.15		Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210				5,400
AP-4	RACEWAY			:										***************************************				
	3/4" Conduit		Est	2,125	LF	2.06	4,373		0.19	412	412	ECND	49.67	20,477				24,80
	1-1/2" Conduit		Est	150	LF	4.67	701		0.28	43	43	ECND	49.67	2,116				2,80
	2" Conduit		Est	0	LF	6.25	0		0.35	0		ECND	49.67	0				
	3" Conduit 5" Conduit		Est Est	250 0	LF LF	13.13 38.33	3,281 0	+	0.65 1.13	161		ECND ECND	49.67 49.67	8,009 0				11,30
						3 00.00			1.13			20140	73.07					
AP-5	DCS SYSTEM ADDITIONS			/								£.						/ · / ·

						Louis	ville Gas & E	lectric					T			E	stimate No.	: 22001B
Sargent	k Lundy <sup>LLC</sup>						Ghent Unit 1										Project No.	: 10584-022
Chica	go						Mitigation Sy											: 12/20/2005
\					ļ		Sodium Bisi										<del> </del>	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote	was the second s		-			lagnitude Co											: 1/27/2006
						-0	ONFIDENTIA	AL-	Wage Rates			<del> </del>	Louisville	e, KY	<b></b>		Preparer Reviewer	
					-				Labor Produ	ictivity =			<u> </u>		<del> </del>		neviewei	•
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	<u>Crew</u> <u>Code</u>	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Instali)	Total Projected Cos
	Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	4(	EHEA	53.92	2,157	,			33,70
						01,000.00	01,000		10.00				1 00.02					00,70
AP-8	DCS PROGRAMMING/INTERFACE		Fot	4	EA	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187	,			3,80
	Interface Hardware Programming /Interface		Est Est	1 1	LT	5,250.00			0.00			WIRE	69.06					5,30
AP-9	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,80
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						693,130				2,558			143,552				836,90
	DEINES DOING OF EVICTING											ļ			ļ			
4	REINFORCING OF EXISTING EQUIPMENT	NONE					Account Antity in a firm of the second contracts of the second contract of the second											
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1														
14001	DANTINO	Tauch in and Field Finish			LS	3,675.00	3,675		1250.00	1,250	1,250	PNTR	55.58	69,475				73,20
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS		3,075			1,200	1,200			09,475				73,20
MISC-2	ROADWORK		Est	0	LS	36,750.00	0	e de la companya del companya de la companya del companya de la co	380.00	0	C	PBIT	62.43	0				
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,90
MISC-4	OTHER											- N - W 1 1 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2						
												ļ						
-	PUMP HOUSE 15' X 20'																	
	PREFAB BLDG.	INCLUDED EVOLVATION O		1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,20
	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,20
MISC-5	CFD MODEL STUDY		Est	1	LS	0.00	0		40.00	40	40	STST	86.46	3,458				3,50
MISC-6	TANK BERM		Est	1	LS	72,000.00	72,000		260.00	260	260	STST	86.46	22,480				94,50
	SOFT WATER SUPPLY SYSTEM		Est	1	LS	36,000.00	36,000		60.00	60	60	STST	86.46	5,188				41,20
MISC-8	MISC. SUBTOTAL						160,963				2,215			136,691				297,700
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
6S-2	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,00
	SUBTOTAL						3,808,730			0	14,471			1,051,368				4,860,30
	Craft Support During Startup Allowance for Premium Time Labor	At 3% of Total Manhours						yantarinin atau gana araba aya a dalah			434	MECH	66.86	29,026				29,000 Not Included

,							ville Gas & E										Estimate No.	22001B
	& Lundy <sup>LLC</sup>						Ghent Unit										Project No.	10584-022
Chica	ngo					SO3	Mitigation S	ystem									Date	12/20/2005
							Sodium Bis						-				Rev Date	
-	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co		<b>-</b>						<u> </u>			1/27/2006
:				1			ONFIDENTIA		Wass Dates	December 1	<u> </u>			100			-	1/2//2006
				-			ONFIDENTI	<b>1L-</b>	Wage Rates				Louisville	e, KY			Preparer	
									Labor Produ	ictivity =			1				Reviewer	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
	Destability I as Day T. O. Alia																	
	Productivity Loss Due To Overtime				<b></b>													Not Included
	Per Diem Expense		MARKET MANAGEMENT OF THE PROPERTY OF THE PROPE		<u> </u>													Not Included
	Project Wrap (Efficacy) Insurance Erection Contractor's General & Administrative	At 5% of Material and Labor		ļ									/					Not Included
	Costs	Costs	·															243,000
	Erection Contractor's Profit	At 8% of Material and Labor Costs																388,800
	Mandatory Spare Parts (Start-up/Testing)	Included w∖Equipment Costs		,														Included w\Equipment Costs
	Special Tools	Included w\Equipment Costs								*								Included w\Equipment Costs
	Consumables	At 0.5% of Equipment/Material Cost																19,000
	Freight To Site	At 4.5% of Equipment/Material Cost																171,400
-	Taxes - Sales/Use/VAT/Business/Etc.													10				Not Included
•	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
	SUBTOTAL INSTALLED COST								. 1	0	14,905			1,080,394				5,711,500
ENO	I CONSTRUCTION															****		
PERMITT	RING / CONSTRUCTION MANAGEMENT ING, MODELING, ETC.	Furnished by Project Team								0								571,200
STARTU	P, TESTING AND REAGENT (15 DAYS)									0						The superior field		50,000
CONTING		At 20% of Total								0								1,266,500
CLIENT II	NTERNAL COST	Furnished by Owner								0						eff af e		100,000
SPARE P										0								Not Included
ESCALAT		Not Included	· ·															0
	T DURING CONSTRUCTION (AFUDC)	Not Included																0
	PROJECT TOTAL :				ļ					0								7,699,200

						Louis	ville Gas & E	lectric									Estimate No.	22002B
Sargent	& Lundy <sup>LLC</sup>			- Distriction			Ghent Unit 1										Project No.	
Chica						SO3	Mitigation Sy		<b>†</b>			1	<u> </u>				<del>                                     </del>	12/20/2005
					<u> </u>		ption 5 - Tro			<del> </del>							Rev Date	
	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co			<del></del>		1						1/27/2006
					ļ		CONFIDENTIA		Wage Rates	Based on		<del> </del>	Louisville	LV				1/2//2006
		- A - A - A - A - A - A - A - A - A - A		1000000			ONLIDENTIA	<u> </u>	Labor Produ			<del>                                     </del>	Louisville	, N I			Preparer	
									Labor Frod	uctivity =		<u> </u>					Reviewer	
						¥			l	<u>Total</u>		İ.		<u>Total</u>				
Item No.	Description	Scope Definition	Cost	Quantity	Unit of	Unit Equip./ Mat.	<u>Total</u> Equipment or	Cost Dovolonment	Unit Man	Man-	Total Man-	Crew	Crew Wage	Construction	Sub-	DOR	DOR	<u>Total</u>
nem no.	<u>Description</u>	Scope Definition	Cost Type	Guantity	Measure	Cost	Material Cost	Cost Development	hours (Base)	hours	hours, Prod	Crew Code	<u>wage</u> <u>Rate</u>	& Erection	Contract	(Furnish)		Projected Co
					e di se		Material Cost		[Dase]	(Base)	=1	1	hate	Cost	<u>s</u>			
			:						<b>1</b>									
	DUCTWORK MODIFICATIONS																	
	MODIFY GAS DUCT TO ACCEPT INJECTION																	
DW-1	NOZZLES	4 1		1														1
	DUCTWORK MODS		Est	1 1	TN	2,625.00	2,625		35.00	35	35	FLDU	89.66	3,138			<u> </u>	5,80
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40			0.27		54	DINS	59.32	3,203			·	4,90
		11																1
DW-2	DUCTWORK SUPPORT STRUCTURES		p	<u> </u>														
	STRUCTURAL STEEL ACCESS & GALLERIES		Est Est	5 400	TN SF	1,890.00 31.50			16.00		80	STST	86.46	6,917				16,40
	AOOLOG & GALLENIES		ESI	400	SF 1	31.50	12,600		0.40	160	100	GALL	71.2	11,392				24,00
DW-4	DUCTWORK SUBTOTAL						26,355				200			04.050				
	BOOTWOIK ODDIOTAL						20,000				329			24,650				51,10
	Injection System			<u> </u>														
	Injection Gystem											<b>-</b>						
-	EQUIPMENT/COMPONENTS																	
	Air Blowers	150 hp each	Est	6	EA	55,125.00			105.00			PUMP	65.83	41,473				372,20
	VFD Rotary Feeder	3 hp - Stainless Steel 2,687,900 lb full - 11,610 ft <sup>3</sup> -	Est	3	EA	10,500.00	31,500		30.00	90	90	TANK	65.78	5,920				37,40
		D=20.7' - H=83.0' - CS Silo - SS														44		t ·
	Long-Term Storage Silo - 1 Unit (10 Days)	Hopper 268,800 lb full - 1,160 ft <sup>3</sup> -	Est	1	EA	590,000.00	590,000		4200.00	4,200	4,200	TANK	65.78	276,276				866,30
		D=8.7' - H=39.0' - CS Silo - SS																
i y	Short-Term Storage Silo - (24 Hours)	Hopper	Est	1	EA	180,000.00	180,000		120.00	120	120	TANK	65.78	7,894		-		187,90
	Injection Manifold (2 Qty)	Stainless Steel	Est	2	EA	10,500.00	21,000		240.00	480	480	MECH	66.86	32,093				53,10
	Injection Nozzles (50 Qty)	Stainless Steel	Est	1 1	LT	10,500.00	10,500		240.00	240	240	MECH	66.86	16,046				26,50
	System Piping																	
	8" - CS	Includes fitting allowance	Est	350	LF LF	18.48			0.46	160		SPNG	70.4	11,236				17,70
	Piping Insulation & Lagging Heat Tracing		Est Est	0	LF LF	6.62 0.00			0.14 0.00	0	0	INSUL WIRE	53.39 69.06	0				
14	Valves	Allowance	Est	1 1	LS	1,050.00			24.75	25		SPNG	70.4	1,742				2,80
	Supply Piping	1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		1		1,000.00	1,000				20	J. 14G	, 0.4	1,742				2,80
	Water Supply	Allowance	Est	0	LS	840.00	o		100.00	0	0	SPNG	70.4	0				
	Air Supply	Allowance	Est	0	LS	525.00	0		80.00	0	0	SPNG	70.4	0				
	Piping Supports	Allowance	Est	1	LS	1,575.00	1,575		60.00	60	60	SPNG	70.4	4,224				5,80
	Piping Rack	Allowance	Est	10	TN	2,200.00	22,000	AAA 4	16.00	160		STST	86.46	13,834				35,80
S-2	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	90	CY	157.50	14,175	;	7.00	630	630	CONP	52.91	33,333		-		47,50
												-						
	STRUCTURAL STEEL	**************************************	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,80
S-3	AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	2,200	LF	10.00	22,000		0.52	1,144	1,144	PILE	82.81	94,735				116,70
S-4	IS SYSTEM SUBTOTAL						1,253,018				8,098			552,639				1,805,50
	MATERIAL UNLOADING SYSTEM																	
NSH-1	TRUCK UNLOADING SYSTEM	Included in silo	Est	0	Set	105,000.00	0		1254.00	o	0	SPNG	70.4	0				
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL			<b> </b>														

						Louis	ville Gas & E	lectric									Estimate No.	: 22002B
Sargent	& Lundy <sup>LLC</sup>						Ghent Unit 1										Project No.	: 10584-022
Chica							Mitigation Sy										<u> </u>	: 12/20/2005
							ption 5 - Tro										Rev Date	1/27/2006
1	Cost Type: Est = Estimated, Bid = Vendor quote		-				agnitude Co						1.	<u> </u>				: 1/27/2006
	Took Type. Lot - Lottmateu, Dia - Vender quote						ONFIDENTIA		Wage Rates	Rased on:			Louisville	kv			Preparer	
ļ			+		<del> </del>		ONIDENTA	<b>1</b>	Labor Produ			-	Louisvine	, , , ,			Reviewer	
			<del>                                     </del>											1			Heviewer	1
															<b> </b>			
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE		<b>1</b>					<u> </u>							<b></b>			<b>†</b>
		Double Ended Unit																
1	480V SWITCHGEAR	Substation with (2) 1MVA, 6.9-480V XFMR's	Est	1 1 15	EA	580,000.00	580,000		500.00	500	500	EHEA	53.92	26,960			1 · · · · · · · · · · · · · · · · · · ·	607,00
	New Breaker at Existing 4160V Switchgear	U.U-TUUV AI IVII 13	Est	<del>                                     </del>	EA	63,000.00	63,000		100.00	100	100	EHEA	53.92	5,392				68,40
	MCC		Est	2	EA	42,000.00	84,000		200.00	400	400	EHEA	53.92	21,568				105,60
	Misc Electrical Equipment & Controls		Est	1	LS	60,900.00	60,900		300.00	300	300	EHEA	53.92					77,10
AP-2	GROUNDING																	
	Cable - 500kcmil GND		Est	2,000	LF	2.10	4,200		0.05	100	100	WIRE	69.06					11,10
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,40
AP-3	CABLE													· .				
F	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60		Routed in 5" Conduit	0.69	0		WIRE	69.06					
	Power Cables for MCC's	3/C 500kcmil, 600kV	Est	250	LF	14.70	3,675	Routed in 3" Conduit	0.69	173	173	WIRE	69.06					15,60
	Power Cables for 480V Switchgear	3/C 4/0kcmil, 5kV	Est	250	LF	8.40		Routed in 2" Conduit Routed in 1-1/2"	0.35	88	88	WIRE	69.06	6,043				8,10
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30	0	Conduit	0.52	0	0	WIRE	69.06	0				
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	150	LF	0.76		Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549				70
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	LF	1.58		Routed in 3/4" Conduit Routed in 1-1/2"	0.05	0	0	WIRE	69.06	0				4
*	Power Cables from MCC to Loads - 50 HP	3/C #4, 600V	Est	150	LF	2.10	315	Conduit Routed in 1-1/2"	0.09	14	14	WIRE	69.06	932				1,20
	Power Cables from MCC to Loads - 100HP	3/C #4/0, 600V	Est	150	LF	9.45		Conduit	0.50	75	75	WIRE	69.06	5,180			gen wêye en gala	6,60
	Power Cables from MCC to Loads - 150HP	3/C #350, 600V	Est	900	LF	10.50	9,450	Routed in 2" Conduit	0.69	621	621	WIRE	69.06	42,886				52,30
	Control Cables - Pumps	5/C #14, 600V	Est	150	LF	0.67		Routed in 3/4" Conduit	0.03	5	5	WIRE	69.06	332				40
	Control Cables - TR Sets	7/C #14, 600V	Est	0 750	LF	0.81		Routed in 1-1/2"	0.04	0	0	WIRE	69.06					
	Instrumentation Cables Data Highway Cable	2 PR #16 SHLD	Est Est	750 1,000	LF LF	0.25 3.15		Routed in 3/4" Conduit Routed in 3/4" Conduit	0.03 0.03	24 32	24 32		69.06 69.06					1,80 5,40
				7,000	tie I	0.10	3,.50		3.00		<u> </u>			2,210				3,40
AP-4	RACEWAY											= 0.1.=						
<b> </b>	3/4" Conduit		Est	2,300	LF LF	2.06 4.67	4,733 1,402		0.19 0.28	446 85	446 85	ECND ECND	49.67 49.67	22,163 4,232				26,900
	1-1/2" Conduit 2" Conduit		Est Est	300 1,150	LF LF	4.67 6.25	7,185		0.28	405	405	ECND	49.67	4,232 20,106				5,600 27,300
	3" Conduit		Est	900	LF	13.13	11,813		0.65	581		ECND	49.67	28,833				40,600
	5" Conduit		Est	0	LF	38.33	0		1.13	0	0	ECND	49.67	0		,		
AP-5	DCS SYSTEM ADDITIONS		<b> </b>															
	Cabinets		Est	1	EA	31,500.00	31,500	<u></u>	40.00	40	40	EHEA	53.92	2,157				33,700
	DCS PROGRAMMING/INTERFACE Interface Hardware		Est		EA	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187				3,800
	Programming /Interface		Est		LT	5,250.00	5,250		0.00	0	0	WIRE	69.06	0				5,300
<u> </u>	LIGHTING ALLOWANCE		Est	1	LT	10,500.00	10,500		100.00	100	100	INEL	60.02	6,002				16,50
			1						, , , , , , , , , , , , , , , , , , ,									
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						890,012				4,163			237,359				1,127,400
		1	<u>L</u>	L	<u> </u>				L	1	1	1			<u> </u>			

						Louis	ville Gas & E	lectric								E	stimate No.:	22002B
Sargent	& Lundy LLC					3	<b>Ghent Unit 1</b>										Project No.:	10584-022
Chica	ago						Mitigation Sy											12/20/2005
***************************************							ption 5 - Tro										Rev Date	
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co										Run Date:	
						-C	ONFIDENTIA	AL-	Wage Rates				Louisville	, KY			Preparer:	<del> </del>
						3-01-0			Labor Produ	ictivity =			1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
	REINFORCING OF EXISTING EQUIPMENT	NONE		and the second s														
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE																
MISC-1	PAINTING	Touch-up and Field Finish	Est	1 1	LS	3,150.00	3,150		1170.00	1,170	1,170	PNTR	55.58	65,029				68,200
MISC-2	ROADWORK		Est	0	LS	36,750.00	0		380.00	0	0	PBIT	62.43	0				1
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4	OTHER																	
	BLOWER HOUSE																	
	PREFAB BLDG (15' x 20' )			1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,20
	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259		•		13,20
MISC-5	CFD MODEL STUDY		Est	1 1	LS	30,000.00	30,000		40.00	40	40	STST	86.46	3,458				33,50
MISC-6	TANK BERM		Est	1	LS	0.00	0		260.00	260	260	STST	86.46	22,480				22,50
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	0.00	0		60.00	60	60	STST	86.46	5,188				5,20
MISC-5	MISC. SUBTOTAL						82,438				2,135			132,244				214,700
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1 1	LT		0							100,000				100,000
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			100,000			,	100,000
	SUBTOTAL						2,251,823			0	14,725			1,046,893				3,298,700
	Craft Support During Startup Allowance for Premium Time Labor	At 3% of Total Manhours									442	MECH	66.86	29,536				29,500 Not Included
	Productivity Loss Due To Overtime																	Not Included Not Included
	Per Diem Expense Project Wrap (Efficacy) Insurance			1														Not included
	Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs																164,90
	Erection Contractor's Profit	At 8% of Material and Labor Costs		3.														263,900 Included
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs	6												•			included w\Equipment Costs

					Louis	ville Gas & E	lectric									Estimate No.	: 22002B
Sargent & Lundy <sup>ŁLC</sup>						<b>Ghent Unit 1</b>										Project No.	: 10584-022
Chicago					SO3	Mitigation S	/stem									Date	: 12/20/2005
						ption 5 - Tro										Rev Date	1/27/2006
Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co			<u> </u>		<del> </del>				~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	+	: 1/27/2006
		100		1		ONFIDENTIA		Wage Rates	Based on:			Louisville	KV			Preparer	
						JOHN IDENTIF		Labor Produ				Louisville	, K1			Reviewer	
								<u>Lubor r roud</u>								neviewer	
Item No. Description	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cost
																	Included
Special Tools	Included w\Equipment Costs																w\Equipment Costs
	At 0.5% of	***************************************														1	00515
Consumables	Equipment/Material Cost				3												11,300
	At 4.5% of																
Freight To Site	Equipment/Material Cost																101,300
Taxes - Sales/Use/VAT/Business/Etc.																	Not Included
Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
SUBTOTAL INSTALLED COST				<b>-</b>						45467			4 070 400	1.25			
CODICIAL INCIALLED COST				<b> </b>						15,167			1,076,429				3,869,600
ENGINEERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team			1					0							<b>-</b>	387,000
PERMITTING, MODELING, ETC.									0							<b> </b>	367,000
STARTUP REAGENT TESTING (15 DAYS)									0			52.	3				50,000
CONTINGENCY	At 20% of Total								0								861,300
CLIENT INTERNAL COST	To Be Furnished by Owner								0								100,000
E PARTS									0								Not Included
LATION	Not Included													74. J.			0
INTEREST DURING CONSTRUCTION (AFUDC)	Not Included																0
DDO JECT TOTAL															. 4		
PROJECT TOTAL:			1						0				Control of the second	t y e			5,267,900

						Louis	ville Gas & E	lectric				T					Estimate No.	: 22003B
Sargent &	Lundy <sup>LLC</sup>						Ghent Unit			1		1	<u> </u>				Project No.	: 10584-022
Chica							Mitigation S										Date	: 12/20/2005
						Option 6	- Vertical Fl	ow WESP	1								Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate									Run Date	: 1/27/2006
			i datu			-0	ONFIDENTIA	AL-	Wage Rates				Louisville	e, KY			Preparer	
									Labor Produ	uctivity =			ļ .	1	_		Reviewer	<u> </u>
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract	DOR (Furnish)	DOR (Install)	Total Projected Co
	DUCTWORK MODIFICATIONS																	
	MODIFY GAS DUCT FOR WESP AND TO ACCEPT INJECTION NOZZLES																	
	DUCTWORK MODS		Est	0	TN	2,500.00	0		35.00		(	FLDU			0			
	INSULATION & LAGGING		Est	0	SF	8.00	0		0.27		1	DINS	59.32	2 (	0			
DW-4	DUCTWORK SUPPORT STRUCTURES								- :									
	STRUCTURAL STEEL		Est	0	TN	1,800.00	0		16.00			STST	86.46				1	
1	ACCESS & GALLERIES		Est	0 **	SF	30.00	0		0.40	1 -		GALL	71.2		1		<b>I</b>	
DW-5	FOUNDATIONS																	
	FOUNDATIONS FOR DUCTWORK AND STRUCTURAL STEEL	INCLUDES EXCAVATION & BACKFILL	Est	0	CY	150.00	0		7.00		(	CONP	52.91	(	D.			
DW-6	AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	0	LF	10.00	0		0.52	2 0	C	PILE	82.81	(				
	DUCTWORK SUBTOTAL						0				0							
	WESP & ASSOCIATED EQUIP																	
WE-1	long, total 150 SCA. All internal 2205, with 2205	INCLUDES ALL ASSOCIATED DUCTWORK AND WASTE WATER EQUIPMENT.PIPING AND TANKS	Est	1	EA	19,450,000.00		BUDGETARY INPUT FROM VENDORS	196033	196,033	196,033	PREC	86.72	17,000,000				36,450,0
WE-3	Chimney Liner Adjustment	RETURN TO EXISTING CHIMNEY	Est	0	LF	0.00	0		-55	0	0	PREC	86.72		)			
WE-4	Chimney Breaching Adjustment	NONE	Est	0	LS	0.00	0		0	0	0	PREC	86.72					
	g rightman			<u> </u>		5.00												
WE-5	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	210	CY	157.50	33,075		7.00	1,470	1,470	CONP	52.91	77,778	3			110,90
WE-6	AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	2,200	LF	10.00	22,000		0.52	1,144	1,144	PILE	82.81	94,735			-	116,70
WE-7	FIBERGLASS DUCT			50	LF	7,200.00	360,000		50.00	2,500	2,500	DUCT	82.81	207,025	5			567,00
WE-8	WE SYSTEM SUBTOTAL						19,865,075				201,147			17,379,537				37,244,60
1.	AUXILIARY POWER SUPPLY SYSTEM/I&C		-															
AP-1I	POWER SOURCE	Double Ended Unit																
	SWITCHGEAR	Substation with (2) 2MVA, 6.9- 480V XFMR's	Est	2	EA	575,000.00	1,150,000		500.00	1,000	1,000	EHEA	53.92	53,920				1,203,90
	New Breaker at Existing 13.2kV Switchgear MCC		Est Est	2	EA EA	63,000.00 52,500.00	126,000 105,000		100.00 240.00	200 480	200	EHEA EHEA	53.92 53.92	10,784 25,882		; · · · · · · · · · · · · · · · · · · ·		136,80 130,90

					T	Louis	ville Gas & E	lectric						1		E	stimate No.:	22003B
Sargent 8	k Lundy <sup>LLC</sup>						<b>Ghent Unit 1</b>										Project No.:	10584-022
^hica						SO3	Mitigation Sy	/stem									Date:	12/20/2005
							- Vertical Flo										Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co										Run Date:	1/27/2006
							ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer:	
				# #					Labor Produ	ctivity =			-	ı			Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
	Misc Electrical Equipment & Controls		Est	1	LS	86,100.00	86,100		504.00	504	504	EHEA	53.92	27,176				113,300
100	ODOLINDINO.																	
AP-2	GROUNDING Cable - 500kcmil GND		Est	2.000	LF	2,10	4,200		0.05	100	100	WIRE	69.06	6,906				11,10
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,40
1			1	T			_,											-,
	CABLE													,				
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	100	LF	33.60		Routed in 5" Conduit	0.69	69	69	WIRE	69.06					8,100
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	0	LF	14.70		Routed in 3" Conduit	0.69	0	0	WIRE	69.06					00.00
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	1,000	LF	8.40	8,400	Routed in 2" Conduit Routed in 1-1/2"	0.35	350	350	WIRE	69.06	24,171				32,600
1	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	3,600	LF	6.30	22 680	Conduit	0.52	1,872	1 872	WIRE	69.06	129,280			.*	152,000
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #2/0, 600V	Est	0	LF	0.76		Routed in 3/4" Conduit	0.05	1,072	1,072	WIRE	69.06					152,000
	Power Cables from MCC to Loads - 1 ~ 311P	3/C #8, 600V	Est	1,500	LF	1.58		Routed in 3/4" Conduit	0.05	80	80	WIRE	69.06					7,900
		1	7	.,				Routed in 1-1/2"				- '						
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	0	LF	2.12		Conduit Routed in 1-1/2"	0.09	0	0	WIRE	69.06	0				
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V	Est	0	LF	2.67		Conduit	0.35	0	0	WIRE	69.06					
	Power Cables from MCC to Loads - 60HP	3/C #2, 600V	Est	0	LF	3.58		Routed in 2" Conduit	0.35	0 48	0	WIRE	69.06					4.00
	Control Cables - Pumps	5/C #14, 600V	Est	1,500	LF 	0.67		Routed in 3/4" Conduit Routed in 1-1/2"	0.03		48	WIRE	69.06	3,315				4,300
	Control Cables - TR Sets	7/C #14, 600V	Est	3,600	LF LF	0.81 0.25		Conduit Routed in 3/4" Conduit	0.04 0.03	144 24		WIRE	69.06 69.06					12,900
	Instrumentation Cables Data Highway Cable	2 PR #16 SHLD	Est Est	750 1,000	LF LF	0.25 3.15		Routed in 3/4" Conduit	0.03	32		WIRE	69.06					1,800 5,400
	RACEWAY											<b>-</b>						
	3/4" Conduit		Est	4,750	LF	2.06			0.19	922	922	ECND	49.67	45,771 50,783				55,500
	1-1/2" Conduit		Est Est	3,600 1,000	LF LF	4.67 6.25			0.28 0.35	1,022 352	1,022	ECND	49.67 49.67					67,600 23,700
	2" Conduit 3" Conduit		Est	0	LF	13.13	0,248		0.65	002	0	ECND	49.67					20,700
	5" Conduit		Est	100	LF	38.33	3,833		1.13	113	113	ECND	49.67					9,400
	DCS SYSTEM ADDITIONS																	
	Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,700
AD 0	DOC DECORAMANACIA TEREACE				<u> </u>													
	DCS PROGRAMMING/INTERFACE Interface Hardware		Est	1	EA	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187				3,800
	Programming /Interface		Est	<u> </u>	LT	5,250.00	5,250		0.00	0	0	WIRE	69.06	0				5,300
AP-9	LIGHTING ALLOWANCE	<u> </u>	Est	1	l LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,800
AF*8	EIGHTHING ALLOWANGE				<u> </u>	10,700.00	.5,7.50											_ ,,500
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL				<u> </u>		1,609,556				7,569			441,458				2,051,200
	REINFORCING OF EXISTING						·								-			
	EQUIPMENT	NONE									-							
	DEMOLITION / RELOCATIONS	NONE																
1 -	MISCELLANEOUS	NONE																
									0075.55			DNA		100.00=				ACT ACT
MISC-1	PAINTING	Touch-up and Field Finish	Est	1 1	LS	87150.00	87,150		3250.00	3,250	3,250	PNTR	55.58	180,635				267,800

						Louis	ville Gas & E	Electric								E	stimate No.:	22003B
Sargent A	& Lundy <sup>LLC</sup>						Ghent Unit 1										Project No.:	
hica	go						Mitigation S					,					Date:	12/20/2005
-		- 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				Option 6	- Vertical Flo	ow WESP	-								Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co										Run Date:	1/27/2006
							ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer:	
									Labor Produ	ictivity =			1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
MISC 2	ROADWORK	20' WIDTH X 1000 LF GRAVEL	Est	1	LS	46000.00	46,000		380.00	380	380	PBIT	62.43	23,723				69,700
	STORM DRAINAGE	GRAVEE	Est	1	LS	7350.00	7,350		300.00	300		YDRN	51.97	15,591				22,900
IVIIOU-3	STORM DRAINAGE		Lot	<u> </u>		7000.00	7,000		000.00			1	01.07	10,001				22,000
MISC-4	OTHER																	
MISC-5	MISC. SUBTOTAL					-	140,500				3,930			219,949				360,400
MISC-1	PAINTING	Touch-up and Field Finish	Est	0	LS		0		3250.00	0	C	PNTR	55.58	0				(
		20' WIDTH X 1000 LF	F		1.0				475.00			PBIT	62.43	0				
Service Control	ROADWORK	GRAVEL	Est	0	LS		U			U				U				
`-3	STORM DRAINAGE		Est	0	LS		0		538.43	0	<u> </u>	YDRN	51.97	0				
MISC-4	OTHER																	
MISC-5	CFD MODEL STUDY		Est	1	LS	0.00	0		40.00	40	40	STST	86.46	3,458			•	3,500
MISC-5	MISC. SUBTOTAL						0				40			3,458				3,500
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
								Includes freight in and										
GS-2	CRANE RENTAL	700 Ton - 4 months	Est	1	LT		0	out						480,000				480,000
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			580,000				580,000
	SUBTOTAL						21,615,131			0	212,686			18,624,403				40,239,700
	Craft Support During Startup	At 3% of Total Manhours									6,381	MECH	66.86	426,606				426,600
	Allowance for Premium Time Labor										***************************************							Not Included Not Included
	Productivity Loss Due To Overtime Per Diem Expense			1														Not Included
	Project Wrap (Efficacy) Insurance																	Not Included
	Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs - WESP																1,039,500
	Erection Contractor's Profit  Mandatory Spare Parts (Start-up/Testing)	At 8% of Material and Labor Costs - WESP Included w\Equipment Costs																1,663,200 Included w\Equipment Costs Included
	Special Tools	Included w\Equipment Costs At 0.5% of																w\Equipment Costs
	Consumables	Equipment/Material Cost		<u> </u>	<u> </u>													108,100

						Louis	ville Gas & E	lectric									Estimate No.	: 22003B
Sargent &	Lundy <sup>LLC</sup>						Ghent Unit							-			Project No.	: 10584-022
Chicag						SO3	Mitigation S	vstem									Date	: 12/20/2005
							- Vertical Fl					<del> </del>						1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote		<u> </u>	<del> </del>			lagnitude Co			<u> </u>			-					: 1/27/2006
	ood Type. Lot – Ediminica, Dia – Veridoi quote			-	-		CONFIDENTIA		Wage Rates	Deced on	<u> </u>		1	107				
				-	-	-(	ONFIDENTI	<b>1L-</b>			<u> </u>	<del> </del>	Louisville	, KY			Preparer	
			-						Labor Produ	ctivity =			1				Reviewer	:
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>S</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
											•							
		At 4.5% of																
	Freight To Site	Equipment/Material Cost														to the state of		972,7
	Taxes - Sales/Use/VAT/Business/Etc.								-									Not Included
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
	SUBTOTAL INSTALLED COST										219,067	4. 2. 1		19,051,009				44,449,8
	OUDITIAL INGUALLED COOL				ļ			the state of the s			213,007			19,051,009				44,443,0
ENGINEE	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team		-						C		100						2,000,20
PERMITTI	NG, MODELING, ETC.									C						*		
	AND TESTING									C					1 14			100,00
CONTING		At 20% of Total								C	)							9,310,0
	ITERNAL COST	To Be Furnished by Owner		<u> </u>						C	)							200,00
SPARE PA					<u> </u>					. С	)							Not Included
ESCALAT		Not Included	<u> </u>					***										
INTEREST	F DURING CONSTRUCTION (AFUDC)	Not Included	ļ		<u> </u>													
		1	1	1	1	1	1											

Chica	& Lundy <sup>LLC</sup> go					<u> </u>	ville Gas & E	1001110	ļ									
Chica				1			<b>Ghent Unit 1</b>		1			l:	ļ.	I.	1 1		Project No.:	10584-022
	go						Mitigation Sy	retom										12/20/2005
							Horizontal F		1								Rev Date	1/27/2006
																		1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote				ļ		agnitude Co						11111-	100				1/2//2000
						-0	ONFIDENTIA	\L-	Wage Rates				Louisville	, K1			Preparer:	
				1.00.50	<u> </u>				Labor Produ	ctivity =			1		-		Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod =1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>S</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
	DUCTWORK MODIFICATIONS	COSTS					January and the second											
															l			<u> </u>
	WEED & ACCOCIATED FOUID			<u> </u>					<b> </b>									
	WESP & ASSOCIATED EQUIP		<del></del>	<u> </u>											-			
			Est		EA	30,610,000.00		BUDGETARY INPUT FROM VENDOR	142817	142,817	142,817	PREC	86.72	12,385,047				42,995,000
					<u> </u>			<u> </u>										
		RETURN TO EXISTING BREECHING	Est	0	LF	5,302.50	0		55	0	0	PREC	86.72	0				(
WE-3	Chimney Breaching Adjustment	garage and the second s	Est	0	LS	21,000.00	0		220	0	0	PREC	86.72	0				(
WE-2	Chiliney Breaching Adjustment		Lot	l		21,000.00												
	Electrical Building	20'x40'	Est	1	EA	21,000.00	21,000		100.00	100	100	STST	86.46	8,646				29,600
		INCLUDES EXCAVATION &	_						7.00	5 070	F 070	00110	50.04	200 000				427,600
	FOUNDATIONS	BACKFILL	Est	810	CY TN	157.50 2,200.00	127,575 374,000		7.00 16.00	5,670 2,720	5,670 2,720	CONP STST	52.91 86.46	300,000 235,171				609,200
	STRUCTURAL STEEL	100 ft LONG	Est Est	170 2,000	LF	2,200.00	20,000		0.52	1,040	1,040		82.81	86,122				106,100
	AUGER CAST PILES (120 TON CAPACITY) FIBER GLASS DUCT 23' DIA	100 IL LONG	Est	450	LF	7,200.00	3,240,000		50.00	22,500			59.32	1,334,700				4,574,700
	WE SYSTEM SUBTOTAL			400		7,200.00	34,392,575			,,-	174,847			14,349,686				48,742,200
	WE CICIEM CODICIAL																	
	AUXILIARY POWER SUPPLY SYSTEM/I&C																,	
AP-1	POWER SOURCE				<u> </u>													
	SWITCHGEAR	Double Ended Unit Substation with (2) 2MVA, 6.9- 480V XFMR's	Est	1	EA	575,000.00	575,000		500.00	500	500	EHEA	53.92	26,960				602,000
	New Breaker at Existing 13.2kV Switchgear		Est		EA	63,000.00	63,000		100.00 240.00	100 480	100	EHEA EHEA	53.92 53.92	5,392 25,882				68,400 130,900
	MCC Misc Electrical Equipment & Controls		Est Est	1	EA LS	52,500.00 86,100.00	105,000 86,100		324.00	324	324	EHEA	53.92					103,600
AP-2	GROUNDING																	
	Cable - 500kcmil GND		Est	2,000	LF	2.10	4,200		0.05	100	100	WIRE	69.06					11,100
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,400
				<u> </u>													:	
	CABLE  Power Cables for MCCla	3/C 750kcmil, 5kV	Est	100	LF	33.60	3 360	Routed in 5" Conduit	0.69	69	69	WIRE	69.06	4,765	<b></b>			8,1:00
		3/C /50kcmil, 5kV	Est	0	LF	14.70		Routed in 3" Conduit	0.69	0	0	WIRE	69.06	0				(
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	1,000	LF	8.40		Routed in 2" Conduit	0.35	350	350	WIRE	69.06	24,171				32,600
						,		Routed in 1-1/2"										4
		3/C #2/0, 600V	Est	2,400	LF	6.30			0.52	1,248	1,248	WIRE	69.06	86,187				101,300
1 1	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	0	LF	0.76		Routed in 3/4" Conduit	0.05 0.05	0 80	0	WIRE WIRE	69.06 69.06	5,490				7,900
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	1,500	LF	1.58		Routed in 3/4" Conduit Routed in 1-1/2"	0.05	80	80	VVINE	09.UD	5,490				7,900
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	0 5	LF	2.12		Conduit	0.09	. 0	0	WIRE	69.06	o				C

		-:	T	<u>T</u> :	1	Louis	ville Gas & E	lectric		I		,	T .		T		Estimate No.:	22004B
Sargent	& Lundy <sup>LLC</sup>						Ghent Unit 1						ļ				Project No.	
Chica							Mitigation S										<del> </del>	12/20/2005
			-		1	Option 7 -	Horizontal F	low WESP										
<u> </u>	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co									:		1/27/2006
				1 2 1 214			ONFIDENTIA		Wage Rates	Based on:			Louisville	. KY			Preparer	ļ
<u> </u>									Labor Produ				1	i i			Reviewer	<del></del>
														· · · · · · · · · · · · · · · · · · ·				
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> <u>Equipment or</u> Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection	Sub- Contract s	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
										(Base)				Cost				
		<u> </u>					<u> </u>					1					<b></b>	
								Routed in 1-1/2"										
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V	Est	0	LF	2.67	0	Conduit	0.35	0	C	WIRE	69.06	0				
	Power Cables from MCC to Loads - 60HP	3/C #2, 600V	Est Est	1,500	LF LF	3.58 0.67	1,000	Routed in 2" Conduit Routed in 3/4" Conduit	0.35 0.03	48	40	WIRE WIRE	69.06 69.06					4 20
	Control Cables - Pumps	5/C #14, 600V	⊏St	1,000	L L L	0.67	1,008	Routed in 1-1/2"	0.03	48	40	VVINE	09.06	3,315				4,30
1 1 100	Control Cables - TR Sets	7/C #14, 600V	Est	2,400	LF	0.81		Conduit	0.04	96	96		69.06	6,630				8,60
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25	189	Routed in 3/4" Conduit	0.03	24	24	WIRE	69.06	1,657				1,80
	Data Highway Cable		Est	1,000	LF	3.15	3,150	Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210				5,40
AP-4	RACEWAY		<u> </u>	<b>-</b>														
AL -4	3/4" Conduit		Est	4,750	LF	2.06	9,776		0.19	922	922	ECND	49.67	45,771				55,500
]	1-1/2" Conduit		Est	2,400	LF	4.67	11,214		0.28	682	682	ECND	49.67					45,100
	2" Conduit		Est	1,000	LF	6.25			0.35	352	352	ECND	49.67	17,484				23,70
	3" Conduit		Est	0	LF	13.13	0		0.65	0	0	ECND	49.67					1
<b></b>	5" Conduit		Est	100	LF	38.33	3,833		1.13	113	113	ECND	49.67	5,598				9,400
AP-5	DCS SYSTEM ADDITIONS																	
A1 -3	Cabinets		Est	1 1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157			es a e e e	33,700
-																Service of the servic		y :
Ar-g	DCS PROGRAMMING/INTERFACE																e e in	
	Interface Hardware		Est Est	1 1	EA LT	2,625.00 5,250.00	2,625 5,250		20.00 0.00	20	20	EHEC WIRE	59.36 69.06	1,187				3,80
	Programming /Interface		ESI	1	<u> </u>	5,250.00	5,250		0.00	0	U	WIRE	69.06	- 0		***************************************		5,30
AP-9	LIGHTING ALLOWANCE		Est	1 1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003			again i	24,80
							057.410				F 776			000 005				4 000 70
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL		<u> </u>				957,418				5,776			336,065				1,293,70
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE	4 4															
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	87,150.00	87,150		3250.00	3,250	3,250	PNTR	55.58	180,635				267,80
	BOADWORK	20' WIDTH X 1000 LF		4.00	1.0	45 007 50	45.000		380.00	200	000	DDIT	60.40	00 700				20.70
MISC-2	ROADWORK	GRAVEL	Est	1-1-	LS	45,937.50	45,938		380.00	380	380	PBIT	62.43	23,723				69,700
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,90
MISC-4	OTHER		<b> </b>															
MISC-5	MISC. SUBTOTAL		ļ				140,438				3,930			219,949				360,40
			<u> </u>					)										
-	GENERAL SUPPORT														1			
	Omnostian OVI I OIII																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
				1				i de la companya de La companya de la co	j									

1						Louis	ville Gas & E	Electric	1,41.4							E	stimate No.:	22004B
Sargent a	& Lundy <sup>LLC</sup>						Ghent Unit	1									Project No.:	10584-022
Chica						SO3	Mitigation S					1						12/20/2005
<u> </u>							Horizontal F										Rev Date	1/27/2006
) —	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co				<del> </del>							1/27/2006
						Order or it	ONFIDENTIA	Al	Wage Rates	Pacad on		1	Louisville	VV			<del> </del>	1/21/2000
							CINFIDENTIA	<b>7L-</b>	Labor Produ			-	Louisville	, NI			Preparer: Reviewer:	
									Labor Produ	ictivity =				<u> </u>			Heviewer	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1		Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
GS-2	CRANE RENTAL	700 Ton - 2 months	Est	1	LT		0	Includes freight in and out						310,000				310,00
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			410,000				410,0
<b> </b>	SUBTOTAL						05 400 404				104.550			45 045 500				F6.665.5
<u> </u>	SUBTUTAL			<b>_</b>			35,490,431				184,553			15,315,700				50,806,3
	Craft Support During Startup	At 3% of Total Manhours									5.537	MECH	66.86	370,176				370,2
	Allowance for Premium Time Labor	a a construction of the co								·	5,507		30.00	0,0,1,0				Not Included
	Productivity Loss Due To Overtime																	Not Included
	Per Diem Expense																	Not Included
	Project Wrap (Efficacy) Insurance																	Not Included
. X	Erection Contractor's General & Administrative	At 5% of Material and Labor											-					
	Costs	Costs - WESP		<u> </u>							44.0							1,009,8
	Erection Contractor's Profit	At 8% of Material and Labor																
		Costs - WESP																1,615,7 Included
																		w\Equipment
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																Costs
				ľ														Included
	Constant To all				4.5													w\Equipment
	Special Tools	Included w\Equipment Costs At 0.5% of																Costs
	Consumables	Equipment/Material Cost	-						100									177,5
	Consumables	At 4.5% of		<b></b>														177,5
	Freight To Site	Equipment/Material Cost			er traine.													1,597,1
	Taxes - Sales/Use/VAT/Business/Etc.	Equipment/material Cost		<u> </u>														Not Included
	Construction Utilities (Elect, Water, etc.) During																	
	Construction	Furnished by Owner			,					-					4.1			By Owner
	SUBTOTAL INSTALLED COST									0	190,089			15,685,876				55,576,60
																****		
	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team				in the second se				0								2,501,00
	ING, MODELING, ETC.			-						0								
	P AND TESTING	At COOK of Total								0		· .						100,00
CONTING	NEDNAL COST	At 20% of Total								0								11,635,50
SPARE P	NTERNAL COST	To Be Furnished by Owner								0								200,00
ESCALAT		Not Included	<u> </u>	-						0								Not Included
	T DURING CONSTRUCTION (AFUDC)	Not Included  Not Included	. 200 1					_										
INTERES	1 DOTHING CONSTRUCTION (AFODO)	140t Hichard																
	PROJECT TOTAL:									0								70,013,1

				· · · · · · · · · · · · · · · · · · ·		Louis	ville Gas & El	lectric								E	stimate No.:	22005B
	110						Ghent Unit 3		1.7								Project No.:	10584-022
Sargent 8	k Lundy <sup>LLC</sup>						Mitigation Sy										Date:	12/20/2005
hica	go				<u> </u>		1 1 - Hydrated										Rev Date	1/27/2006
			y 1				agnitude Cos							,			Run Date:	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer:	
									Labor Produ	ctivity =			1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract S	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
	DUCTWORK MODIFICATIONS																	
	MODIFY GAS DUCT TO ACCEPT INJECTION							are en										
DW-1	NOZZLES DUCTWORK MODS	and the second of the second o	Est	1	TN	2,625.00			35.00	35		FLDU	89.66	3,138				5,800
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40	1,680		0.27	54	54	DINS	59.32	3,203				4,900
					<u> </u>		erana a la											
DW-2	DUCTWORK SUPPORT STRUCTURES		Est	5	TN	1,890.00	9,450		16.00	80	80	STST	86.46					16,400
	STRUCTURAL STEEL		Est	400	SF	31.50			0.40	160			71.2	11,392				24,000
	ACCESS & GALLERIES												<b> </b>					
							26,355				329			24,650				51,100
DW-4	DUCTWORK SUBTOTAL						20,000						i .					
<u> </u>	L. I N Overhoom																	
	Injection System																	
l -	EQUIPMENT/COMPONENTS	The second se																
<b>+</b> —	Air Blowers	150 hp each	Est	5	EA	55,125.00			105.00	525		PUMP	65.83					310,200
	VFD Rotary Feeder	3 hp - Stainless Steel	Est	3	EA	10,500.00	31,500		30.00	90	90	TANK	65.78	5,920				37,400
	Long-Term Storage Silo - Common for 2 Units (10	2,937,600 lb full - 19,615 ft <sup>3</sup> - D=20.5' - H=82.0' - CS Silo - SS Hopper	Est	1	EA	808,000.00	808,000		2545.52	2,546	2,546	TANK	65.78	167,444		,		975,400
	Days), Unit cost is split between Units 3 and 4	293,760 lb full - 1,920 ft <sup>3</sup> - D=8.5' - H=38.0' - CS Silo - SS				200 200 2	000.000		764.00	764	764	TANK	65.78	50,256				250,300
	Short-Term Storage Silo - (24 Hours)	Hopper	Est	1 1	EA EA	200,000.00			240.00	480					-			53,100
	Injection Manifold (2 Qty)	Stainless Steel	Est Est	1 1	LT EA	10,500.00			240.00				66.86					26,500
	Injection Nozzles (50 Qty)	Stainless Steel	Lot	1 '	<del>  -'</del>													
<u> </u>	System Piping 8" - CS	Includes fitting allowance	Est	350	LF	18.48			0.46	161	161	SPNG	70.4					17,800
	Piping Insulation & Lagging		Est	0	LF	6.62			0.14 0.00	0	0	INSUL WIRE	53.39 69.06					
	Heat Tracing		Est	0	LF	0.00			24.75	25	25	SPNG	70.4					2,800
	Valves	Allowance	Est	1	LS	1,050.00	1,050		1 27.70					.,. 12				
	Supply Piping	Allowance	Est	0	LS	840.00	0		100.00		0	SPNG	70.4	0				0
	Water Supply	Allowance	Est	0	LS	525.00	0		80.00		0	SPNG	70.4					0
	Air Supply Piping Supports	Allowance	Est	1	LS	1,575.00	1,575		60.00			SPNG	70.4	4,224				5,800 35,800
l	Piping Supports Piping Rack	Allowance	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
		INCLUDES EXCAVATION &			l ov	157.50	7,875		7.00	350	350	CONP	52.91	18,519				26,400
	FOUNDATIONS	BACKFILL	Est Est	50 10	CY TN	2,200.00			16.00	160	160	STST	86.46	13,834				35,800
IS-3	STRUCTURAL STEEL AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	2,200	LF	10.00			0.52	1,144	1,144	PILE	82.81	94,735				116,700
IS-4	AUGEN CAST PILES (120 TON CAPACITY)	NAME OF THE PROPERTY OF THE PR					4 460 465				6,704			464,542				1,894,000
IS-5	IS SYSTEM SUBTOTAL						1,429,593				0,704			704,042				1,004,000
	MATERIAL UNLOADING SYSTEM		<u> </u>							· · · · · · · · · · · · · · · · · · ·								
	TO LOW DELINGTON	INCLUDED IN SILO	Est	1 0	Set	315,000.00	0		1753.67	0	0	SPNG	70.4	0				0
1 1	TRUCK DELIVERY  AUXILIARY POWER SUPPLY	IN OLOUED IN OLO		-														
	SYSTEM/I&C						A Line Company											
AP-1	POWER SOURCE	- Constant - Constant - Constant	. 12.32		' ,	. Land Carte Communication Com	s Real of the second		1,	<u> </u>	<u> </u>	L	<u> </u>			L		

1					1	Louis	ville Gas & E	lectric							<u> </u>	1	stimate No.:	: 22005B
Sargent 8	k Lundy <sup>LLC</sup>					1	Ghent Unit 3											: 10584-022
Chica					<u> </u>		Mitigation Sy		-								Date:	: 12/20/2005
							n 1 - Hydrate										Rev Date	1/27/2006
<b> </b> -	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co		<u> </u>	<del> </del>							Run Date:	: 1/27/2006
ļ	0001 1 ypc. 201 - 2011111101, 210 - 1011001 quoto						ONFIDENTIA		Wage Rates	Based on:			Louisville	KY			Preparer	1
·							ON IDENTIF		Labor Produ				1				Reviewer	
				<del>                                     </del>									•				TICVICITO!	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection	Sub- Contract	DOR (Furnish)	DOR (Install)	Total Projected Cos
1										(Base)				Cost				
	480V SWITCHGEAR	Double Ended Unit Substation with (2) 2MVA, 6.9-480V XFMR's	Est	1	EA	575,000.00			500.00	500	500	EHEA	53.92					602,00
	New Breaker at Existing 6900V Switchgear		Est	1 1	EA	63,000.00			100.00	100		EHEA	53.92	5,392				68,40
	MCC		Est	2	EA	42,000.00			200.00		400		53.92	21,568				105,60
	Misc Electrical Equipment & Controls		Est	1 1	LS	60,900.00	60,900		300.00	300	300	EHEA	53.92	16,176	<u> </u>		<u> </u>	77,10
AP-2	GROUNDING		· · · · · · · · · · · · · · · · · · ·	<u> </u>	<b>l</b>				<del> </del>			<b> </b>			-			
AL-5	Cable - 500kcmil GND		Est	2,000	LF	2.10	4,200		0.05	100	100	WIRE	69.06	6,906			.:	11,100
	Grounding Rod		Est	12	EA	199.50			4.00	48	48	PILE	82.81	3,975	***************************************			6,400
				T	l .													3, 70.
AP-3	CABLE																	
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60		Routed in 5" Conduit	0.69	0	0	WIRE	69.06	0				
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.70		Routed in 3" Conduit	0.69	173	173		69.06	11,913				15,600
-	Power Cables for 480V Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.40	0	Routed in 2" Conduit Routed in 1-1/2"	0.35	0	0	WIRE	69.06	0				
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30		Conduit	0.52	0	0	WIRE	69.06	n				
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #2/0, 600V	Est	150	LF	0.76		Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549				700
1 -	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	150	LF	1.58		Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549				800
*	Power Cables from MCC to Loads - 50 HP	3/C #4, 600V	Est	150	LF	2.10	315	Routed in 1-1/2" Conduit Routed in 1-1/2"	0.09	14	14	WIRE	69.06	932				1,20
	Davida Cables from MOO to Landa 100UD	0/0 #4/0 600\/	Est	150	LF	9.45	1 / 18	Conduit	0.50	75	75	WIRE	69.06	5,180				6,600
	Power Cables from MCC to Loads - 100HP Power Cables from MCC to Loads - 150HP	3/C #4/0, 600V 3/C #350, 600V	Est	300	LF LF	10.50		Routed in 2" Conduit	0.50	207	207		69.06	14,295				17,40
<u></u>	Control Cables - Pumps	5/C #14, 600V	Est	150	T LF	0.67		Routed in 3/4" Conduit	0.03	5	5	WIRE	69.06	332				400
	Control Cables - 1 unips	9/0 #14, 000V		1				Routed in 1-1/2"							-			
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81	0	Conduit	0.04	0	0	WIRE	69.06	0				
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25	189	Routed in 3/4" Conduit	0.03	24	24	WIRE	69.06	1,657				1,80
	Data Highway Cable		Est	1,000	LF	3.15	3,150	Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210				5,400
AD 4	DACEWAY			<b>_</b>	<u> </u>													
AP-4	RACEWAY 3/4" Conduit		Est	2,300	LF	2.06	4,733		0.19	446	446	ECND	49.67	22,163				26,900
	1-1/2" Conduit		Est	300	T LF	4.67			0.28	85	85	ECND	49.67	4,232				5,600
	2" Conduit		Est	300	LF	6.25	1,874		0.35	106	106	ECND	49.67	5,245	A			7,100
	3" Conduit		Est	900	LF	13.13	11,813		0.65	581	581	ECND	49.67	28,833				40,600
	5" Conduit		Est	0	LF	38.33	0		1.13	0	0	ECND	49.67	0				
		<u> </u>			<u> </u>													
	DCS SYSTEM ADDITIONS		Est	1 1	EA	31,500.00	31,500		40.00	40	- 40	EHEA	53.92	2,157				33,700
	Cabinets		⊏SI	1 1	<del>                                     </del>	31,500.00	31,000		40.00	40	40	H-/1	30.82	2,107				33,700
AP-8	DCS PROGRAMMING/INTERFACE				<b>1</b>	- in the second												
	Interface Hardware		Est	1	EA	2,625.00	2,625		20.00	20		EHEC	59.36	1,187				3,800
	Programming /Interface		Est	1	LT	5,250.00	5,250	-	0.00	0	0	WIRE	69.06	0				5,300
						10 500 00	10.500		100.00	100	100	INICI	60.00	0.000				10.50
AP-9	LIGHTING ALLOWANCE		Est	1 1	LT	10,500.00	10,500	<u> </u>	100.00	100	100	INEL	60.02	6,002				16,500
					<u> </u>				<u> </u>									
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						871,538				3,370			188,413				1,060,000
					<u> </u>				<u> </u>									
1	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION (DEL COATIONS	NONE																
	DEMOLITION / RELOCATIONS	NONE	بمقرض شميا	1	<u> </u>	<u> </u>			<u> </u>		1							<del>Čarženia i promotoria</del>

				T		Louis	ville Gas & E	lectric						<u> </u>		E	stimate No.:	22005B
Sargent	& Lundy <sup>LLC</sup>						<b>Ghent Unit 3</b>										Project No.:	1
Chica	ago					SO3	Mitigation Sy											12/20/2005
							n 1 - Hydrate										Rev Date	<del> </del>
	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co										Run Date:	1/27/2006
							ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY		***************************************	Preparer:	
									Labor Produ	ctivity =			1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
	MISCELLANEOUS	NONE																
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,150.00	3,150		1170.00	1,170	1,170	PNTR	55.58	65,029				68,20
MISC-2	ROADWORK		Est	0	LS	36,750.00	0		380.00	0	0	PBIT	62.43					
MISC-3	STORM DRAINAGE		Est	0	LS	7,350.00	0		300.00	0	0	YDRN	51.97	0				
MISC-4	OTHER																	
	BLOWER HOUSE								1									
	FOUNDATIONS PREFAB BLDG. 15'X20'	INCLUDES EXCAVATION & BACKFILL	Est Est	25 1	CY LS	157.50 38,000.00	3,938 38,000		7.00 130.00	175 130	175 130	CONP STST	52.91 86.46	9,259 11,240				13,200 49,200
MISC-5	CFD MODEL STUDY		Est	1	LS	30,000.00	30,000		40.00	40	40	STST	86.46	3,458				33,50
-6	TANK BERM		Est	1 1	LS	0.00	0		260.00	260	260	STST	86.46	22,480				22,50
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	0.00	0		60.00	60	60	STST	86.46	5,188				5,20
MISC-5	MISC. SUBTOTAL						75,088				1,835			116,653				191,80
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							150,000				150,00
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			150,000				150,00
	SUBTOTAL						2,402,574			0	12,238			944,258				3,346,90
	Craft Support During Startup Allowance for Premium Time Labor Productivity Loss Due To Overtime	At 3% of Total Manhours									367	MECH	66.86	24,548				24,500 Not Included Not Included
	Per Diem Expense Project Wrap (Efficacy) Insurance Erection Contractor's General & Administrative	At 5% of Material and Labor																Not Included Not Included
	Costs	Costs At 8% of Material and Labor At 8% of Material and Labor		: : :														167,300
	Erection Contractor's Profit	Costs	***************************************															267,80 Included
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																w\Equipment Costs Included
	Special Tools	Included w\Equipment Costs At 0.5% of Equipment/Material															ł	w\Equipment Costs
	Consumables	Cost At 4.5% of Equipment/Material																12,000
	Freight To Site Taxes - Sales/Use/VAT/Business/Etc.	Cost	r															108,100 Not Included

-						Louis	ville Gas & E	lectric			-					1	Estimate No.	
C	I L. LLC						<b>Ghent Unit 3</b>	:			:				,		<del></del>	: 10584-022
	& Lundy <sup>LLC</sup>					SO3	Mitigation Sy	/stem									Date	: 12/20/2005
nica	igo						n 1 - Hydrate										Rev Date	1/27/2006
							lagnitude Co					<b> </b>					Run Date	: 1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote			1			ONFIDENTIA		Wage Rates	Based on:	1		Louisville	KY			Preparer	:
						-0	ONFIDENTIA	<b>\L-</b>	Labor Produ				1			<b> </b>	Reviewer	
					1 2 2 2 2		1.0		Labor Flour	Ctivity =			<u> </u>					
		2 -			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1													
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod		Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cost
																		<u> </u>
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
			<b> </b>	<b>-</b>						(	12,606			968,806				3,926,600
	SUBTOTAL INSTALLED COST		<b>-</b>	1												en e		
ENGINE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team	1							(								392,660
PERMITT	TING, MODELING, ETC.				1					(							ļ	50,000
STARTU	P, TESTING AND REAGENT (15 DAYS)		:	*							]	ļ					<u> </u>	873,900
CONTING		At 20% of Total							<b>-</b>		<b>1</b>						<b> </b>	100,000
	NTERNAL COST	Furnished by Owner							-	7	1	-					<b>_</b>	Not Included
SPARE P	PARTS								-	<del>                                     </del>	1	1					<b> </b>	(
ESCALA"	TION	Not Included							1	<u> </u>		<del> </del>					1	1 0
INTERES	ST DURING CONSTRUCTION (AFUDC)	Not Included			<u> </u>							1						<b>†</b>
				<u> </u>	1													5,343,160
<i>i</i> .	PROJECT TOTAL:		1			J	1	L				-						

		T T		· · · · · · · · · · · · · · · · · · ·	<u> </u>	Louis	ville Gas & E	lectric									Estimate No.	: 22006B
							Ghent Unit 3										Project No.	: 10584-022
Sargent 8	Lundy <sup>LLC</sup>						Mitigation Sy		<b>-</b>								Date	: 12/20/2005
ca	go						Magnesium										Rev Date	1/27/2006
							agnitude Cos		1			1					Run Date	: 1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote				1		ONFIDENTIA		Wage Rates	Based on:	:		Louisville	, KY			Preparer	:
							ONFIDENTIA	\L	Labor Produ				1				Reviewer	
					ļ													
		N 19 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1																
<u>ltem No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
	DUCTWORK MODIFICATIONS																	
	MODIEV OAS DUST TO ACCEPT IN JECTION		****									·						
	MODIFY GAS DUCT TO ACCEPT INJECTION NOZZLES	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				rest	<u> </u>			E C :	00.00	0.100			<u> </u>	- 500
DW-1	DUCTWORK MODS		Est	1	TN	2,625.00			35.00 0.27	35 54	35 54	FLDU	89.66 59.32		<u> </u>	<b></b>	<u> </u>	5,80 7,40
	INSULATION & LAGGING	6" THICK INSULATION	Est	200	SF	21.00	4,200		0.27	54	34	באווע	39.32	3,203			1	1 ,40
	and the second of the second o				-								1					
DW-4	DUCTWORK SUPPORT STRUCTURES		Est	5	TN	1,890.00	9,450		16.00	80		STST	86.46					16,40
	STRUCTURAL STEEL ACCESS & GALLERIES		Est	400	SF	31.50	12,600		0.40	160	160	GALL	71.2	11,392			<b></b>	24,00
	ACOLOG & GALLLI IILO			2 32					-			1	<u> </u>				1	
DW C	BOILER MODS	And the second s										F. C.	00.00					11,50
DW-6	WALL AND TUBE MODS		Est	2	TN	2,625.00	5,250		35.00	70	/(	FLDU	89.66	6,276			<b> </b>	11,50
	**************************************	and the second s		1								<b>l</b>						1
									<b>-</b>									
	DUOTINO DI CUIDTOTAL				1		34,125				399			30,926			<u> </u>	65,10
<u> </u>	DUCTWORK SUBTOTAL											<u> </u>	ļ					
												<u> </u>					1	
	Injection System																	
												<u> </u>	ļ					
IS-1	EQUIPMENT/COMPONENTS					21,000.00	63,000		40.00	120	120	MECH	66.86	8,023				71,00
	Air Blowers	Not required	Est Est	3	EA EA	10,500.00		A STATE OF THE STA	30.00	30		MECH	66.86		-			12,50
	VFD Rotary Feeder	Not required 1,617,900 lb full - 17,060 ft3 -	ESI			10,000.0										-	1.0	
	Lower Town Charago Topk	D=26.3' - H=31.6' -	Est	1	EA	239,000.0			580.00	580	580	TANK	65.78	38,152	<u> </u>		ļ	277,20
	Long-Term Storage Tank - Short-Term Storage Silo - (24 Hours)	Not required	Est	0	EA	0.00			60.00 80.00	160	160	TANK MECH	65.78 66.86					52,70
	Air Compressors (2 Qty)	50 hp - 2 X 100% 808,320 lb full - 8,520 ft3 -	Est	2	EA	21,000.0	0 42,000	Carrier Commence	80.00	100	100	IVILOT	- 00.00	10,000			1	02,70
		808,320 lb full - 8,520 π3 - D=20.8' - H=25.0' - CS Silo -															l	
	A 5 1 7 1 4 1 1 2 3 4 (O.4 1 1 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	SS Hopper	Est		EA	115,000.0			880.00	880	880	TANK	65.78					172,90
	Mixing Tank - 1 Unit - (24 Hours) Mixing Tank Agitator (1 Qty)	20 hp - CS Shaft	Est	1	EA	21,000.0	0 21,000		30.00	30	30	MECH	66.86	2,006	ļ		<b></b>	23,00
	WILNING FAIR AGRACUT (T QLY)	125,000 lb full - 2,000 ft3 -				40.000.0	40.000		880.00	880	986	TANK	65.78	57,886				105,90
	Water Storage Tank - 1 Unit (24 Hrs)	D=13.7' - H=13.7' - CS	Est	1 1	EA	48,000.0 5,250.0			20.00	120	120	PUMP	65.83					39,40
	Slurry/Water Pumps (6 Qty)	2 hp - CS	Est Est	6 2	EA EA	10,500.0			240.00	480	480	MECH	66.86	32,093				53,10
,	Injection Manifold (2 Qty)	Stainless Steel Stainless Steel	Est	1	T LT	42,000.0			96.00	96	96	MECH	66.86	6,419				48,40
<u> </u>	Dual Fluid Injection Nozzles (20 Qty)	Statifiess Steel								<b></b>		05::5	<b> </b>					1
	System Piping 1" - CS	Includes fitting allowance	Est	300	LF	2.2			0.16	49		SPNG	70.4	3,464				4,10
	4" - CS	Includes fitting allowance	Est	50	LF	9.2			0.33	17		SPNG	70.4	1,162				1,60
	Piping Insulation & Lagging		Est	350	LF	2.9			0.08 0.31	26 109		INSUL WIRE	53.39 69.06					2,400 14,800
	Heat Tracing		Est	350	LF	21.0			24.75	25		SPNG	70.4	1,742				2,80
	Valves	Allowance	Est	1 1	LS	1,050.0	0 1,050		24.75			0.110	, , , , ,	1,, 32				
	Supply Piping		Est	200	LS	840.0	0 168,000		100.00	20,000	20,000	SPNG	70.4	1,408,000				1,576,00
	Water Supply	Allowance		200	LS	525.0			80.00	16,000	16,000	SPNG	70.4		,			1,231,40
	Air Supply	Allowance	.Est	200	LS	2,100.0			40.00	40	40	SPNG	70.4	2,816				4,90
	Piping Supports	Allowance Allowance	Est	10	TN	2,200.0			16.00	160	160	STST	86.46	13,834				35,800
	Piping Rack	INCLUDES EXCAVATION &						<u> </u>	7.00	770	770	CONP	52.91	40,741				58,100
IS-2	FOUNDATIONS	BACKFILL	Est	110	CY	157.5			7.00 16.00		160	STST	86.46					35,800
IS-3	STRUCTURAL STEEL	N. C.	Est	10	TN	2,200.0	U <b>I</b> 22,000		10.00	100	100	, 0.01		10,004				

. [	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		T	T	T	Louis	ville Gas & E		1	T	T	1	1	T	T		Estimate No.	· 22006B
Sargent	& Lundy <sup>LLC</sup>		1.	<del> </del>		Louis	Ghent Unit 3										Project No.	
Chica			-			503	Mitigation S		-	<del> </del>			<del> </del>					: 12/20/2005
			<del> </del>		<del> </del>		Magnesium			+	-						Rev Date	<b>_</b>
<b> </b> -	Cost Type: Est = Estimated, Bid = Vendor quote		<del> </del>	<del> </del>			lagnitude Co			<del> </del>						·		: 1/27/2006
	Cost Type. Lat - Latiniated, Did = Vendor quote			1	<u> </u>		ONFIDENTIA		Wage Rates	Daned and			Louisville	LCV.			ļ	
1			-				ONFIDENTIA	4L-	Labor Produ			-	Louisville	, KY			Preparer Reviewer	
				-			ļ		Labor Produ	uctivity =			,				Heviewer	
											<b> </b>					,	<b> </b>	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cost</u>
IS-4	AUGER CAST PILES (120 TON CAPACITY)	90 ft LONG	Est	0	LF	10.00	0		0.52	2 C	) 0	PILE	82.81	0				0
IS-5	IS SYSTEM SUBTOTAL		<b>_</b>	<u> </u>			980,017			<u> </u>	40,731			2,843,955				3,823,800
			<b>-</b>		-				1									
	MATERIAL UNLOADING SYSTEM	and and the state of the state								<del>                                     </del>								
ASH-1	TRUCK UNLOADING SYSTEM		Est	1	Set	105,000.00	105,000		1254.00	1,254	1,254	SPNG	70.4	88,282				193,300
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL			<u> </u>	ļ		105 000				1.054			00 000				100 000
An-o	MATERIAL UNLOADING STSTEM SUBTUTAL		<b>_</b>		<u> </u>		105,000		<u> </u>		1,254			88,282				193,300
	AUXILIARY POWER SUPPLY		*					<u> </u>										
	SYSTEM/I&C								1		1							
	<u> </u>	: .																
AP-1	POWER SOURCE																	
	SWITCHGEAR	Double Ended Unit Substation with (2) 1 MVA, 6.9-480V XFMR's	Est	1 %	EA	460,000.00	460,000		500.00	500	500	EHEA	53.92	26,960				487,000
	New Breaker at Existing 13.2kV Switchgear	0.5-400 V XI WII 13	Est	i	EA	63,000.00	63,000		100.00	100	100	EHEA	30.32	20,500				63,000
	MCC		Est	2	EA	42,000.00	84,000		200.00	400	400	EHEA	53.92	21,568			ra gr	105,600
	Misc Electrical Equipment & Controls		Est	1	LS	8,400.00	8,400		300.00	300	300	EHEA	53.92	16,176	***************************************			24,600
AP-2	GROUNDING		ļ		<u> </u>						0		-					
M 2	Cable - 500kcmil GND		Est	2,000	LF	2.10	4,200		0.05	100	100	WIRE	69.06	6,906		-		11,100
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,400
	CABLE	100 7501 77 5137						Davidad la Ell Caradalla	0.00			WOF						
	Power Cables for MCC's Power Cables for MCC's	3/C 750kcmil, 5kV 3/C 500kcmil, 5kV	Est Est	0 250	LF LF	33.60 14.70	3 675	Routed in 5" Conduit Routed in 3" Conduit	0.69 0.69	173	173	WIRE WIRE	69.06	U				0
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.40		Routed in 2" Conduit	0.35	0	0	WIRE						
						***************************************		Routed in 1-1/2"					:					
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30		Conduit	0.52 0.05	0	0	WIRE	69.06	0				10
	Power Cables from MCC to Loads - 1 ~ 5HP Power Cables from MCC to Loads - 15HP	3/C #10, 600V 3/C #8, 600V	Est Est	300 150	LF LF	0.76 1.58		Routed in 3/4" Conduit Routed in 3/4" Conduit	0.05 0.05	16 8		WIRE WIRE	69.06 69.06	1,098 549		**************************************		1,300 800
	One Cables from MOO to Loads - 15FF	υ, ο πο, οσον	Lot	130	<u> </u>	1.36		Routed in 1-1/2"	0.05	O		*****	39.00	549				1 300
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	0	LF	2.12	0	Conduit	0.09	0	O	WIRE			1			
								Routed in 1-1/2"										
	Power Cables from MCC to Loads - 50HP Power Cables from MCC to Loads - 60HP	3/C #4, 600V 3/C #2, 600V	Est Est	100 50	LF LF	2.67 3.58		Conduit Routed in 2" Conduit	0.35 0.35	35 18	35	WIRE WIRE	69.06	1,209	<u> </u>			1 400
	Control Cables - Pumps	5/C #14, 600V	Est	300	LF LF	0.67		Routed in 3/4" Conduit	0.33	10	10	WIRE	69.06	663				1,400 900
		3.5, 5557						Routed in 1-1/2"		.,								550
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81		Conduit	0.04	0		WIRE	69.06	0				0
	Instrumentation Cables	2 PR #16 SHLD	Est Est	750 1,000	LF LF	0.25 3.15		Routed in 3/4" Conduit Routed in 3/4" Conduit	0.03 0.03	24 32	24 32	WIRE WIRE	69.06	1,657				1,800
	Data Highway Cable		⊏St	1,000	LF	3.15	3,150	nouted in 3/4 Conduit	0.03	32	32	WINE	-				-	
AP-4	RACEWAY										l					***************************************		
***************************************	3/4" Conduit		Est	2,500	LF	2.06	5,145		0.19	485	485	ECND						
	1-1/2" Conduit		Est	100	LF	4.67	467		0.28	28		ECND						
	2" Conduit 3" Conduit		Est Est	50 250	LF LF	6.25 13.13	312 3,281		0.35 0.65	18 161	18	ECND ECND						
	5" Conduit		Est	0	LF	38.33	0,201		1.13	0	0	ECND						
											o							

<u> </u>				I	T	Louis	ville Gas & E	lectric		<u> </u>	<u> </u>		T		1	F	stimate No.:	22006B
Sargent 4	k Lundy <sup>LLC</sup>						Ghent Unit 3										Project No.:	
Chica	go					SO3	Mitigation Sy	/stem										12/20/2005
			<u> </u>				Magnesium											1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote	and the party of the second se		ļ			agnitude Co			<u> </u>			ļ					1/27/2006
				ļ	ļ		ONFIDENTIA	<b>\L-</b>	Wage Rates Labor Produ		·		Louisville	e, KY			Preparer:	
																·	Heviewei	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
	DCS SYSTEM ADDITIONS Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	0	EHEA						
			Lot			01,000.00	01,000		10.00	1	0	)						
	DCS PROGRAMMING/INTERFACE Interface Hardware		Est	1	EA	2,625.00	2,625		20.00	20	20	EHEC						
	Programming /Interface		Est	i	LT	5,250.00	5,250		0.00	0	0	WIRE	69.06	0				5,300
AP-9	LIGHTING ALLOWANCE		Est	1	LT	10,500.00	10,500		100.00	100	100	INEL						
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						689,199				2,615			80,761				709,200
*	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE		-														
	MISCELLANEOUS	NONE							-	:								
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	5,250.00	5,250		1550.00	1,550	1,550	PNTR	55.58	86,149				91,400
MISC-2	ROADWORK	Not Required	Est	0	LS	36,750.00	0		380.00	0	0	PBIT	62.43	0				C
	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4	OTHER																	
		INCLUDES EXCAVATION &																
***************************************	FOUNDATIONS	BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,200
	PREFAB BLDG.		Est	1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,200
MISC-5	CFD MODEL STUDY		Est	1	LS	100,000.00	100,000		40.00	40		STST	86.46	3,458				103,500
MISC-6	TANK BERM		Est	1	LS	76,000.00	76,000		260.00	260	260	STST	86.46	22,480				98,500
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	35,000.00	35,000		60.00	60	60	STST	86.46					40,200
MISC-5	MISC. SUBTOTAL						54,538				2,155			122,239				176,700
	GENERAL SUPPORT																	
***************************************	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,000
	SUBTOTAL						2,073,879			0	47,514			3,297,288				5,310,300
	Craft Support During Startup	At 3% of Total Manhours					)				1,425	MECH	66.86	95,303				95,300

						Louis	ville Gas & E	lectric								E	Estimate No.:	: 22006B
Sargent &	د Lundy <sup>LLC</sup>						<b>Ghent Unit 3</b>	}									Project No.	: 10584-022
Chica	90					SO3	Mitigation Sy	/stem									Date	: 12/20/2005
		And the second s					Magnesium										Rev Date	
	Cost Type: Est = Estimated, Bid = Vendor quote	:		<b> </b>	<del> </del>		agnitude Co					<u> </u>		1			-	: 1/27/2006
	Cost type. Est = Estimated, Did = Vendor quote			<del> </del>	ļ				Wage Rates	Danad and			1	LVV			<del> </del>	
				ļ			ONFIDENTIA	\L-	<u> </u>			ļ	Louisville	2, KT			Preparer	
									Labor Produ	ictivity =							Reviewer	3
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
	Allowers of an Drawing Time Labor					2. 2.												Not Included
	Allowance for Premium Time Labor Productivity Loss Due To Overtime			<b>-</b>	<b> </b>		·····		<del> </del>				1				<del> </del>	Not Included Not Included
	Per Diem Expense			<u> </u>	<b>_</b>				<u> </u>									Not included
	Project Wrap (Efficacy) Insurance			1	<b>_</b>						<u> </u>	<b> </b>						Not included
	Erection Contractor's General & Administrative	At 5% of Material and Labor			<u> </u>				<u> </u>									Trot moladed
	Costs	Costs															1	265,500
	Erection Contractor's Profit	At 8% of Material and Labor Costs																424,800
										:	,							Included w\Equipment
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																Costs Included w\Equipment
	Special Tools	Included w\Equipment Costs																Costs
	Consumables	At 0.5% of Equipment/Material Cost At 4.5% of																10,400
	Freight To Site	Equipment/Material Cost			i.											·		93,30
	Taxes - Sales/Use/VAT/Business/Etc.	Equipment/waterial Cost		<b>I</b>	ļ								<b></b>				<b></b>	Not Included
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner										-						By Owner
	SUBTOTAL INSTALLED COST									0	48,939			3,392,592				6,199,600
ENGINEE	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team		ļ						0		<b></b>						620,000
PERMITTI	NG, MODELING, ETC.		<b></b>	ļ				***************************************	ļ	0								0
	, TESTING AND REAGENT (15 DAYS)	1.000/ (7.1.)		<b>_</b>	ļ					0								50,000
CONTING	ENCY	At 20% of Total								0								1,373,900 100,000
SPARE PA	ITERNAL COST	To Be Furnished by Owner			<b> </b>					0							<u> </u>	Not Included
ESCALAT		Not Included		<b>-</b>					I									not included
	Γ DURING CONSTRUCTION (AFUDC)	Not included  Not included	<u> </u>		<u> </u>													0
I TILLI	. Domina continuomenta (Al obo)	140t moladou		1														
1	PROJECT TOTAL :				1					0						,		8,343,500

						Louis	ville Gas & E	lectric							T	E	stimate No.:	22007B
Sargent	& Lundy LLC			4			Ghent Unit 3								-		Project No.:	<b> </b>
Chica							Mitigation Sy						1				<u> </u>	12/20/2005
							ion 3 - Soda								-		Rev Date	<del> </del>
1	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co										Run Date:	<del> </del>
							ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer:	ļ
									Labor Produ				1				Reviewer:	
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Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
	DUCTWORK MODIFICATIONS																	
	MODIFY GAS DUCT TO ACCEPT INJECTION																	
DW-1	NOZZLES				1												ļ.	
	DUCTWORK MODS		Est	1	TN	2,625.00	2,625		35.00	35	35	FLDU	89.66	3,138		· · · · · · · · · · · · · · · · · · ·		5,800
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40			0.27	54			59.32	3,203				4,900
DW-4	DUCTWORK SUPPORT STRUCTURES								-									
DVV-4	STRUCTURAL STEEL		Est	5	TN	1,890.00	9,450		16.00	80		STST	86.46	6.017	******			16.400
	ACCESS & GALLERIES		Est	400	SF	31.50			0.40	160		GALL	71.2					16,400 24,000
									1				, , , ,	71,002				27,000
DW-9	DUCTWORK SUBTOTAL						26,355				329			24,650				51,100
																		01,100
	Injection System																-	
	EQUIPMENT/COMPONENTS																	
	Process Technology Package (PTP) by URS		Est	1 1	EA	1,800,000.00	1,800,000		20.00	20	20	PUMP	65.83	1,317				1,801,300
	Pumps (6 Qty)	4 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP	Est	6	EA	2,100.00	12,600		20.00	120		PUMP	65.83		-			20,500
		420,250 lb full - 5,180 ft <sup>3</sup> - D=17.6' - H=21.2' - SS	Est	1	EA	363,000.00	363,000		535.21	535	535	TANK	65.78	35,206				398,200
		309,312 lb full - 4,957 ft <sup>3</sup> -						***************************************		300	333							390,200
	Soft H <sub>2</sub> O Storage Tank - 1 Unit - (24 Hours)	D=18.48' - H=18.48' - CS	Est	100	EA	83,000.00	83,000		489.52	490	490		65.78	32,201				115,200
	Agitator (1 Qty) Air Compressors (2 Qty)	SS Shaft - 20 HP 2 x 100% - 50 HP	Est Est	2	EA EA	21,000.00 21,000.00	21,000 42,000		30.00 80.00	30 160	30		66.86	2,006		······································		23,000
		Stainless Steel	Est	2	EA	10,500.00	21,000		240.00	160 480	480	MECH MECH	66.86 66.86	10,698 32,093		· · · · · · · · · · · · · · · · · · ·		52,700 53,100
	Dual Fluid Injection Nozzles (100 Qty)	Stainless Steel	Est	1	LT	21,000.00	21,000		480.00	480	480	MECH	66.86					53,100
	System Piping	L=250' - D=4" - SS / L=50' - D=4" - CS / L=50' - D=2" - SS					,											
	6" - SS	Includes fitting allowance	Est	250	LF	30.61	7,652		0.42			SPNG	70.4	7,392				15,000
	6" - CS	Includes fitting allowance	Est	50	LF	11.89		-	0.42			SPNG	70.4	1,478				2,100
	4" - SS	Includes fitting allowance	Est	50	LF	24.89			0.33	17		SPNG	70.4	1,162				2,400
	Piping Insulation & Lagging		Est	350	LF	9.14	3,197	***************************************	0.17	60	60	INSUL	53.39	3,177				6,400
	Heat Tracing Valves	Allowance	Est	350	LF LC	21.00	7,350 2,520		0.31 48.00	109 48		WIRE SPNG	69.06					14,800
	Supply Piping	Allowance	Est		LS	2,520.00	2,520		48.00	48	48	orna	70.4	3,379				5,900
	Water Supply	Allowance	Est	1	LS	840.00	840		100.00	100	100	SPNG	70.4	7,040				7,900
	Air Supply	Allowance	Est	1	LS	525.00	525		80.00	80	80	SPNG	70.4	5,632				6,200
	Piping Supports	Allowance	Est	1	LS	2,940.00	2,940		112.00	112	112	SPNG	70.4	7,885				10,800
	Piping Rack	Allowance INCLUDES EXCAVATION &	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
IS-2	FOUNDATIONS	BACKFILL	Est	75	CY	157.50	11,813		7.00	525	525	CONP	52.91	27,778				39,600
	STRUCTURAL STEEL		Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
	AUGER CAST PILES (125 TON CAPACITY)	100 ft LONG	Est	0	LF	10.00	0		0.52	0	o	PILE	82.81	-0				0
IS-3	ROYALTY FEE	n	Est	0	LF										-			Λ
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					-	Louis	ville Gas & E	lectric				1				F	stimate No.:	22007B
Carmant	ຼ & Lundy <sup>LLC</sup>					Louis	Ghent Unit 3					-	-				Project No.:	
Sargent of Chica						503	Mitigation S										<u> </u>	12/20/2005
7111Ca	go .						tion 3 - Soda										Rev Date	
	Coat Times Est. Estimated Bid Mandau mate				ļ												Run Date:	
	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co		W D-4	D				101			ļ	1/2//2006
		****			ļ	-0	ONFIDENTIA	4L-	Wage Rates			ļ	Louisville	, KY			Preparer:	
									Labor Produ	ictivity =	-		1		<u> </u>		Reviewer:	
<u>Item No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	<u>DOR</u> (Install)	<u>Total</u> <u>Projected Co</u>
IS-4	IS SYSTEM SUBTOTAL						2,446,275				3,810			253,595				2,699,80
	MATERIAL UNLOADING SYSTEM											:						
ASH-1	TRUCK UNLOADING SYSTEM		Est	1	Set	105,000.00	105,000		1254.00	1,254	1,254	SPNG	70.4	88,282				193,30
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL						105,000				1,254			88,282				193,30
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE	Double Ended Unit																
	SWITCHGEAR	Substation with (2) 1MVA, 6.9-480V XFMR's	Est	1	EA	460,000.00	460,000		500.00	500	500	EHEA	53.92	26,960				487,00
	New Breaker at Existing 13.2kV Switchgear	6.9-480V XFIVINS	Est	1	EA	63,000.00	63,000		100.00	100	100		53.92	5,392				68,40
	MCC		Est	2	EA	42,000.00	84,000		200.00	400	400	EHEA	53.92	21,568				105,60
	Misc Electrical Equipment & Controls		Est	1	LS	8,400.00	8,400		300.00	300	300	EHEA	53.92	16,176				24,60
AP-2	GROUNDING																	
	Cable - 500kcmil GND		Est	2,000	LF	2.10	4,200		0.05	100	100	WIRE	69.06	6,906				11,10
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48		PILE	82.81	3,975				6,40
	CABLE	0/0.7501			<del>                                     </del>	20.60		Douted in 5" Conduit	0.60			WIDE	60.06	0		***************************************	***************************************	
	Power Cables for MCC's	3/C 750kcmil, 5kV 3/C 500kcmil, 5kV	Est Est	0 250	LF LF	33.60 14.70		Routed in 5" Conduit Routed in 3" Conduit	0.69 0.69		173	WIRE	69.06 69.06	11,913				15,60
	Power Cables for MCC's Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF LF	8.40		Routed in 2" Conduit	0.89			WIRE						15,60
	1 Over Gables for Gwildingear	676 476KGITIII, GKV	1			3.13		Routed in 1-1/2"	0.00	<u>_</u>	· ·		00.00			-		
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30	0	Conduit	0.52	0	0	WIRE	69.06	0				
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	200	LF_	0.76	151	Routed in 3/4" Conduit		11	11	WIRE	69.06	732				90
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	LF	1.58	0	Routed in 3/4" Conduit Routed in 1-1/2"	0.05	0	0	WIRE	69.06	0				
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	50	LF	2.12	106	Conduit Routed in 1-1/2"	0.09	5	5	WIRE	69.06	311				40
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V	Est	100	LF	2.67	267	Conduit	0.35	35	35	WIRE	69.06	2,417				2,70
	Power Cables from MCC to Loads - 60HP	3/C #2, 600V	Est	0	LF	3.58	0	Routed in 2" Conduit	0.35	0	0	WIRE	69.06	0				
	Control Cables - Pumps	5/C #14, 600V	Est	175	LF	0.67	118	Routed in 3/4" Conduit Routed in 1-1/2"	0.03	6	6	WIRE	69.06	387				50
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81	0	Conduit	0.04	0	0	WIRE	69.06	0			-,	4
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25		Routed in 3/4" Conduit		24	24	WIRE	69.06	1,657				1,80
	Data Highway Cable		Est	1,000	LF	3.15	3,150	Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210				5,40
	RACEWAY		Ect	2,125	LF	2.06	4,373		0.19	412	710	ECND	49.67	20,477		-		24,80
	3/4" Conduit 1-1/2" Conduit		Est Est	150	LF LF	2.06 4.67			0.19	412	412 43	ECND	49.67	20,477				2,80
	2" Conduit		Est	0	LF	6.25			0.25		0	ECND	49.67	2,110				2,30
	3" Conduit		Est	250	ĹF	13.13			0.65	161	161	ECND	49.67	8,009				11,30
	5" Conduit		Est	0	LF	38.33	0		1.13	0	0	ECND	49.67	0				
۱۲-5	DCS SYSTEM ADDITIONS		<b>1</b>															
	Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,70
			I	I	1		1									-		

<b>1</b>			William Control			Louis	ville Gas & E	lectric				1				E	stimate No.:	22007B
Sargent	& Lundy <sup>LLC</sup>						<b>Ghent Unit 3</b>										Project No.:	
Chica	ngo					SO3	Mitigation Sy	/stem									Date:	12/20/2005
_							ion 3 - Soda										<del> </del>	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co											1/27/2006
			1 2 2 2 2			-0	ONFIDENTIA	\L-	Wage Rates Labor Produ	~~~			Louisville	, <b>KY</b>			Preparer: Reviewer:	
									Labor Frode	Ctivity =							neviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cost</u>
	Interface Hardware		Est	1	EA	2,625.00	2,625		20.00	20	20		59.36	1,187				3,800
	Programming /Interface		Est	1 1	LT_	5,250.00	5,250		0.00	0	0	WIRE	69.06	0				3,800 5,300
AP-9	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,800
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						693,130				2,558			143,552				836,900
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE							·									
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,675.00	3,675		1250.00	1,250	1,250	PNTR	55.58	69,475				73,200
1 2	ROADWORK		Est	0	LS	36,750.00	0		380.00	0	0	PBIT	62.43	0				0
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4	OTHER																	
	PUMP HOUSE 15' X 20'																	
IS-2	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,200
	PREFAB BLDG.		Est	1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,200
MISC-5	CFD MODEL STUDY		Est	1	LS	0.00	0		40.00	40	40	STST	86.46	3,458				3,500
MISC-6	TANK BERM		Est	1 :	LS	61,000.00	61,000		260.00	260	260	STST	86.46	22,480				83,500
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	37,000.00	37,000		60.00	60	60	STST	86.46	5,188				42,200
MISC-5	MISC. SUBTOTAL						150,963				2,215			136,691				287,700
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
GS-2	GENERAL SUPPORT SUBTOTAL						0	Windows and the second			. 0			100,000				100,000
	SUBTOTAL						3,421,723			0	10,167			746,770				<b>4,168,800</b> 0
	Craft Support During Startup Allowance for Premium Time Labor Productivity Loss Due To Overtime Per Diem Expense	At 3% of Total Manhours									305	MECH	66.86	20,392				20,400 Not Included Not Included
	Per Diem Expense Project Wrap (Efficacy) Insurance																	Not Included Not Included

						Louis	ville Gas & E	lectric								E	stimate No.	: 22007B
Sargent	& Lundy <sup>LLC</sup>	•					<b>Ghent Unit 3</b>										Project No.	: 10584-022
Chic	ago					SO3	Mitigation Sy	/stem									Date	: 12/20/2005
							tion 3 - Soda										Rev Date	1/27/2006
1	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co					1	1				Run Date	: 1/27/2006
				. 71			ONFIDENTIA		Wage Rates	Rased on:			Louisville	KV	1		Preparer	
				<del> </del>			ON IDENTIA	1	Labor Produ				1	, K1			Reviewer	
				<b> </b>					Luborrioda	outry =							Tieviewei	
Item No	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cost
	Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs		:							· .							208,400
	Erection Contractor's Profit	At 8% of Material and Labor Costs																333,500
											· · · · · · · · · · · · · · · · · · ·						l	Included
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																w\Equipment Costs
	Special Tools	Included w\Equipment Costs																Included w\Equipment
h	Special Tools	At 0.5% of																Costs
	Consumables	Equipment/Material Cost At 4.5% of																17,100
	Freight To Site	Equipment/Material Cost																154,000
	Taxes - Sales/Use/VAT/Business/Etc.																	Not Included
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner										4						By Owner
	CURTOTAL INCTALLED COOT																	
<u> </u>	SUBTOTAL INSTALLED COST		/							0	10,472			767,162				4,902,200
ENGINE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team	***************************************							n								490,200
PERMIT	ING, MODELING, ETC.									0								0
STARTU	P, TESTING AND REAGENT (15 DAYS)									0								50,000
CONTIN	GENCY	At 20% of Total								0								1,088,500
	NTERNAL COST	Furnished by Owner								0								100,000
SPARE I		Nathalisalad								0								Not Included
	TION IT DURING CONSTRUCTION (AFUDC)	Not Included Not Included																1 0
INTERES		Not included																I
	PROJECT TOTAL:				<del> </del>			***************************************										6,630,900

. :						Louis	ville Gas & E	lectric									Stimate No.:	22008B
Sargent &	Lundy <sup>LLC</sup>						<b>Ghent Unit 3</b>										Project No.:	
							Mitigation Sy											12/20/2005
							Sodium Bist										Rev Date	1/26/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co					-					Run Date:	1/27/2006
			1.43			-C	ONFIDENTIA	\L-	Wage Rates	Based on:			Louisville	, KY			Preparer	:
									Labor Produ	activity =			1				Reviewer:	
									-									
<u>Item No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
	DUCTWORK MODIFICATIONS			:							4							
	Months and the second s						· · · · · · · · · · · · · · · · · · ·											
	MODIFY GAS DUCT TO ACCEPT INJECTION																	
DW-1	NOZZLES DUCTWORK MODS		Est	<del>  1</del>	TN	2,625.00	2,625		35.00	35	25	FLDU	89.66	3,138				
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40	1,680		0.27	54	54	DINS	59.32	3,138				5,80 4,90
							.,						33.02	0,200				7,30
DW-4	DUCTWORK SUPPORT STRUCTURES																	
	STRUCTURAL STEEL ACCESS & GALLERIES		Est Est	5 400	TN SF	1,890.00 31.50	9,450 12,600		16.00	80		STST GALL	86.46	6,917				16,40
	ACCESS & GALLERIES		ESI	400	or .	31.50	12,000		0.40	160	160	GALL	71.2	11,392				24,00
DW-9	DUCTWORK SUBTOTAL						26,355				329			24,650				51,10
	Injection System							- And the state of										
Company of the Company																		
	EQUIPMENT/COMPONENTS Process Technology Package (PTP). The cost shown here is for a single skid shared by Unit 3 and 4.	P&ID, Control Logic, Injection and metering pump skids, Proprietory injection lances 4 - CS internals - 2.0 HP / 4 -	Budget	1	EA	1,200,000.00	1,200,000		200.00	200	200	MISC	65.83	13,166				1,213,200
	Pumps (0 Qty)	SS internals - 1.0 HP, included in PTP	Est	0	EA	0.00	0		20.00	0	o	PUMP	65.83	0				
		825,400 lb full - 12,100 ft <sup>3</sup> -																
	SBS Solution Tank - 1 Unit (10 Days)	D=23.4' - H=28.0' - SS 309,312 lb full - 4,957 ft <sup>3</sup> -	Est	1	EA	217,000.00	217,000		1064.00	1,064	1,064	TANK	65.78	69,990				287,00
	Soft H <sub>2</sub> O Storage Tank - 1 Unit - (24 Hours)	D=18.48' - H=18.48' - CS	Est	1	EA	45,000.00	45,000		820.92	821	821	TANK	65.78	54,000				99,000
	Agitator (1 Qty)	SS Shaft - 20 HP	Est	1	EA	10,000.00	10,000		30.00	30	30	MECH	66.86	2,006				12,000
	Air Compressors (2 operating, 1 standby for each			_													·	
	Unit)	3 x 100% - 150 HP Stainless Steel included in	Est	3	EA	225,000.00	675,000		120.00	360	360	MECH	66.86	24,070				699,100
	Injection Manifold (2 Qty)  System Piping	PTP L=300' - D=6" - SS / L=200' - D=6" - CS / L=100' - D=4" - SS	Est	2	EA	0.00			0.00	0	0	MECH	66.86	0				
	6" - SS	Includes fitting allowance	Est	300	LF · –	30.61	9,182		0.42	126		SPNG	70.4	8,870				18,100
	6" - CS	Includes fitting allowance	Est	200	LF	11.89			0.42	84			70.4	5,914				8,300
	4" - SS	Includes fitting allowance	Est	100	LF LF	24.89			0.33	33 85	33		70.4	2,323				4,800
	Piping Insulation & Lagging Heat Tracing		Est Est	500 500	LF LF	9.14 21.00	4,568 10,500		0.17 0.31	85 155	85 155	INSUL WIRE	53.39 69.06	4,538 10,704				9,100 21,200
	Valves	Allowance	Est	1	LS	2,520.00	2,520		48.00	48	48		70.4	3,379				21,200 5,900
	Supply Piping			<u> </u>		2,020.00	2,020		10.00			J. 140	, 5.4	3,379				5,900
	Water Supply piping	Allowance	Est	1	LS	840.00	840		100.00	100		SPNG	70.4	7,040				7,900
	Air Supply piping	Allowance	Est	1	LS	525.00	525		80.00	80	80	SPNG	70.4	5,632				6,200
	Piping Supports	Allowance	Est	1	LS	2,940.00	2,940		112.00	112		SPNG	70.4	7,885				10,800
	Piping Rack	Allowance	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
ائ	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	90	CY	157.50	14,175		7.00	630	630	CONP	52.91	33,333				47,500
IS-3	STRUCTURAL STEEL	Allowance	Est	10	TN	2,200.00	22,000		16.00	160	160	STST :	86.46	13,834				35,800
						73337		<u> </u>	1					. 5,554				30,000

						Louis	ville Gas & E	Electric		T		T	1	T			Estimate No.	22008B
Sargent 8	k Lundy <sup>LLC</sup>						<b>Ghent Unit</b> :	3					1				Project No.	
Chica						SO3	Mitigation S	ystem					<del></del>				+	: 12/20/2005
		·				Option 4 -	<b>Sodium Bis</b>	ulfite (SBS)									Rev Date	<u> </u>
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co											1/27/2006
							ONFIDENTI		Wage Rates	Based on:			Louisville	. KY			Preparer	
									Labor Produ	ctivity =			1				Reviewer	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> <u>Equipment or</u> <u>Material Cost</u>	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
IS-3	AUGER CAST PILES (125 TON CAPACITY)	100 ft LONG	Est	2,200	LF	10.00	22,000		0.52	1,144	1,144	PILE	82.81	94,735				116,70
-		Not included \$ per MW to be															:	
IS-4	ROYALTY FEE	Not Included, \$ per MW, to be negotiated with Vendor	Est	0	LF				l					^			1	
													<u> </u>				<u> </u>	
IS-5	IS SYSTEM SUBTOTAL										5,192			362,086				2,638,40
	MATERIAL UNLOADING SYSTEM																	
ASH-1	TRUCK UNLOADING SYSTEM		Est	<del>  1</del>	Set	105,000.00	105,000		1254.00	1,254	1 054	SPNG	70.4	00.000				100
				<u> </u>		100,000.00	100,000		1204.00	1,204	1,434	SPING	/0.4	88,282				193,30
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL						105,000				1,254			88,282				193,30
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE																	
	1 GWEN GOONGE	Double Ended Unit			<b> </b>													
1		Substation with (2) 1 MVA,												÷				
	SWITCHGEAR	6.9-480V XFMR's	Est	1	EA	488,750.00	488,750		500.00	500	500	EHEA	53.92					515,70
	New Breaker at Existing 13.2kV Switchgear MCC		Est Est	1 2	EA EA	63,000.00 42,000.00	63,000 84,000		100.00 200.00	100 400	100 400	EHEA EHEA	53.92 53.92	5,392 21,568				68,40
	Misc Electrical Equipment & Controls		Est	1	LS	8,400.00	8,400		300.00	300	300	EHEA	53.92	16,176				105,60 24,60
AP-2	GROUNDING																	
	Cable - 500kcmil GND		Est	2,000	LF	2.10	4,200		0.05	100		WIRE	69.06	6,906				11,10
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,40
AP-3	CABLE								•									
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	100	LF	33.60	3.360	Routed in 5" Conduit	0.69	69	60	WIRE	69.06	4,765				0.10
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.70	3,675	Routed in 3" Conduit	0.69	173	173	WIRE	69.06	11,913				8,10 15,60
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.40	0	Routed in 2" Conduit Routed in 1-1/2"	0.35	0	0	WIRE	69.06	0				.0,00
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30		Conduit	0.52	٨	, a , a , a , a , a , a	WIRE	69.06		·			
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	200	LF	0.76	151	Routed in 3/4" Conduit	0.05	11	11	WIRE	69.06	732				900
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	LF	1.58		Routed in 3/4" Conduit	0.05	0	0	WIRE.	69.06	0				(
e g <sup>11</sup> , e	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	50	LF	2.12	106	Routed in 1-1/2" Conduit Routed in 1-1/2"	0.09	5	5	WIRE	69.06	311				400
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V	Est	100	LF	2.67		Conduit	0.35	35	35	WIRE	69.06	2,417	. 1			2,700
	Power Cables from MCC to Loads - 150HP	3/C 250kcmil, 600V	Est	250	LF	3.58	895	Routed in 3" Conduit	0.35	88	88	WIRE	69.06	6,043				6,900
	Control Cables - Pumps	5/C #14, 600V	Est	175	LF	0.67		Routed in 3/4" Conduit	0.03	6	6	WIRE	69.06	387				500
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81		Routed in 1-1/2" Conduit	0.04	۸	٦	WIRE	69.06	ار				
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25	189	Routed in 3/4" Conduit	0.03	24	24	WIRE	69.06	1,657	<u>_</u>			1,800
	Data Highway Cable		Est	1,000	LF	3.15		Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210				5,400
A-5 4	RACEWAY																~	
f —	3/4" Conduit		Est	2,125	LF	2.06	4,373		0.19	412	412	ECND	49.67	20,477				24,800
	1-1/2" Conduit		Est	150	LF	4.67	701		0.28	43	43	ECND	49.67	2,116			1	2,800
	2" Conduit		Est	250	LF	6.25	1,562		0.35	88	88	ECND	49.67	4,371				5,900
	3" Conduit 5" Conduit		Est Est	250 100	LF LF	13.13 38.33	3,281 3,833		0.65 1.13	161 113	161	ECND ECND	49.67 49.67	8,009 5,598			1	11,300 9,400

			;			Louis	ville Gas & E	lectric								E	stimate No.:	22008B
Sargent &	& Lundy <sup>LLC</sup>						<b>Ghent Unit 3</b>										Project No.:	10584-022
Chica	ngo		-			SO3	Mitigation Sy	/stem	ļ									12/20/2005
<u> </u>			:- 			Option 4 -	Sodium Bisu	ultite (SBS)	-	-	ļ	ļ	-				Rev Date	<del> </del>
	Cost Type: Est = Estimated, Bid = Vendor quote		: 		1		agnitude Co		Week Baker	<u> </u>							Run Date:	<del> </del>
ļ					ļ.		UNFIDENTIA	\L-	Wage Rates		<del>                                     </del>	ļ	Louisville	T		<del></del>	Preparer: Reviewer:	
									Euser 1 reut				1				neviewei.	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
AP-5	DCS SYSTEM ADDITIONS										- CANANA AND AND AND AND AND AND AND AND AN							
	Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,700
	DCS PROGRAMMING/INTERFACE												<b> </b>					
	Interface Hardware		Est	1	EA	2,625.00			20.00	20	20	EHEC						3,800 5,300
	Programming /Interface		Est	1	LT	5,250.00	5,250		0.00		: C	WIRE	69.06	S U	)			5,300
AP-9	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,800
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL				2		731,530				2,916			164,329	*			895,900
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE																
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,675.00	3,675		1250.00	1,250	1,250	PNTR	55.58	69,475				73,200
MISC-2	ROADWORK		Est	0	LS	36,750.00	0		380.00	0	0	PBIT	62.43	0				.0
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4	OTHER																	
	PUMP HOUSE 15' X 20'																	
					10	38,000.00	38,000		130.00	100	100	стот	06.40	11,240				10.000
	PREFAB BLDG.	INCLUDES EXCAVATION &	:	1	LS					130		STST	86.46					49,200
	FOUNDATIONS	BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,200
MISC-5	CFD Model Study		Est	1	LS	0.00	0		40.00	40	40	STST	86.46	3,458				3,500
MISC-6	Berm around Tanks	60,000 gallon tank, 12" concrete wall, 6" slab, sump, for 110% containment (40' x 40' x 6' high)	Est	1: 32	LS	74,000.00	74,000		260.00	260	260	STST	86.46	22,480				96,500
MISC-7	Soft Water Supply System	36" x 60" regeration 1,845 gallon	Est	1	LS	23,000.00	23,000		60.00	60	60	STST	86.46	5,188				28,200
MISC-8	MISC. SUBTOTAL						149,963				2,215			136,691				286,700
							,				_,_ 10							200,100
	GENERAL SUPPORT											-			1			
	GENERAL SUPPURI					•								-				
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
GS-2	GENERAL SUPPORT SUBTOTAL						ol			-	o	<u>-</u>		100,000				100,000

<b>l</b> '						Louis	ville Gas & E	lectric							-		Estimate No.:	22008B
Sargent /	& Lundy <sup>LLC</sup>						<b>Ghent Unit 3</b>										Project No.	10584-022
Chica	ago			<del> </del>			Mitigation Sy		-								<del></del>	12/20/2005
Offica				1	<del> </del>	Ontion 4	Sodium Bist	ilfita (CDC)	<del> </del>		+				<b>-</b>			<del></del>
																	Rev Date	1/26/2006
	Cost Type: Est = Estimated, Bid = Vendor quote			1	1		agnitude Co										Run Date	1/27/2006
						-C	ONFIDENTIA	AL-	Wage Rates	Based on:			Louisville	, KY			Preparer	
							•		Labor Produ	ctivity =			1				Reviewer	
		-																
<u>ltem No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	<u>Sub-</u> <u>Contract</u> <u>s</u>	<u>DOR</u> (Furnish)	DOR_ (Install)	<u>Total</u> <u>Projected Co</u>
				·														
	SUBTOTAL			<b> </b>	1		3,275,963				12,105			889,204		-		4,165,4
	JODIOTAL			1	1		3,273,303		1		12,105			009,204			<b>!</b>	4,100,41
	Craft Support During Startup	At 3% of Total Manhours			1				-		363	MECH	66.86	24,281				24,30
	Allowance for Premium Time Labor	7 tt 0 /0 0/ Total Marinouro			<del>line de la constanti</del>							W.EGIT	00.00	2 1,20				Not Included
	Productivity Loss Due To Overtime			1														Not Included
	Per Diem Expense			1				**************************************								***************************************		Not Included
	Project Wrap (Efficacy) Insurance	- : -:								AND THE REAL PROPERTY AND THE PARTY AND THE								Not Included
	Erection Contractor's General & Administrative	At 5% of Material and Labor				-												
- 1	Costs	Costs																208,30
	Erection Contractor's Profit	At 8% of Material and Labor																
	Liection Contractors Front	Costs																333,20
					:		,											Included
1				1														w\Equipment
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs							-					· · · · · · · · · · · · · · · · · · ·		-		Costs
														11 11 11			34.5	Included
1	Consider Totals	In all ideal in Affairing and Coats									1					tu kush	1,000	w\Equipment
	Special Tools	Included w\Equipment Costs At 0.5% of		<b>-</b>	<b>-</b>				<u> </u>									Costs
	Consumables	Equipment/Material Cost																16,40
	Consumables	At 4.5% of	*****	<u> </u>	<del> </del>	1			·									10,40
	Freight To Site	Equipment/Material Cost			1									er German				147,40
	Taxes - Sales/Use/VAT/Business/Etc.	anpinonamatorial coot			1				1	,								Not Included
	Construction Utilities (Elect, Water, etc.) During			<b></b>														
	Construction	Furnished by Owner			1						27.							By Owner
				l														
	SUBTOTAL INSTALLED COST									0	12,469			913,485				4,895,00
<i>/</i>										-								
	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team								0								489,50
	ING, MODELING, ETC.									0								
	P, TESTING AND REAGENT (15 DAYS)				ļ					0								50,00
CONTING		At 20% of Total							1	0		<u> </u>						1,086,90
	NTERNAL COST	Furnished by Owner		<u> </u>					1	0								100,00
SPARE PA		Not beliefed		-						0							~	Not Included
ESCALAT	T DURING CONSTRUCTION (AFUDC)	Not Included Not Included		<b> </b>	<b>_</b>				<u> </u>								v.	
NIERES	I DURING CONSTRUCTION (APUDC)	inot included			1				I									
	, and the second of the second	1			8.													

DUCTWO  MODIFY GA NOZZLES DUCTWO INSULATIO  DW-2 DUCTWORI STRUCTU ACCESS &  DW-4 DUCTWORI  EQUIPMEN Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracin Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	IIC.						ville Gas & E	100010	1	1	I.	i	I	l.	1		170	22009A
Item No.  DUCTWO  DUCTWO  MODIFY GA NOZZLES DUCTWORI STRUCTU ACCESS &  DW-4 DUCTWORI STRUCTU ACCESS &  Injection S  EQUIPMEN' Air Blowers VFD Rotar Long-Term Days), Unit Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Traci Valves Supply Pip Water Su Air Suppl Piping Sup Piping Sup Piping Rac							<b>Ghent Unit 3</b>										Project No.:	10584-022
Item No.  DUCTWO  MODIFY GA NOZZLES DUCTWOI INSULATIO  DW-2 DUCTWORI STRUCTU ACCESS &  DW-4 DUCTWORI STRUCTU ACCESS &  Injection S  EQUIPMEN' Air Blowers VFD Rotar Long-Term Days), Unit Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Traci Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac						SO3	Mitigation Sy	/stem			i.						Date:	12/20/2005
Item No.  DUCTWO  MODIFY GA NOZZLES DUCTWO INSULATIO  DW-2 DUCTWORI STRUCTU ACCESS &  DW-4 DUCTWORI  EQUIPMEN Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracit Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac						0	ption 5 - Tro	na									Rev Date	
DUCTWO  MODIFY GA NOZZLES DUCTWO INSULATIO  DW-2 DUCTWORI STRUCTU ACCESS &  DW-4 DUCTWORI  EQUIPMEN Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracit Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate									Run Date:	1/27/2006
DUCTWO  MODIFY GA NOZZLES DUCTWO INSULATIO  DW-2 DUCTWORI STRUCTU ACCESS 8  DW-4 DUCTWORI  Injection 9  EQUIPMEN' Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracio Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	,						ONFIDENTIA		Wage Rates	Based on:			Louisville,	KY			Preparer:	
DUCTWO  MODIFY GA NOZZLES DUCTWO INSULATIO  DW-2 DUCTWORI STRUCTU ACCESS 8  DW-4 DUCTWORI  Injection 9  EQUIPMEN' Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracio Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac									Labor Produ	uctivity =			1				Reviewer:	
DUCTWO  MODIFY GA NOZZLES DUCTWO INSULATIO  DW-2 DUCTWORI STRUCTU ACCESS 8  DW-4 DUCTWORI  Injection 9  EQUIPMEN' Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracio Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac																		
MODIFY GA NOZZLES DUCTWOR INSULATIO  DW-2 DUCTWORI STRUCTU ACCESS &  DW-4 DUCTWORI  EQUIPMEN' Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracit Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract s	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
DW-1 NOZZLES DUCTWORI INSULATION INSULATION INSULATION STRUCTU ACCESS &  DW-4 DUCTWORI  Injection S  EQUIPMENT Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracin Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	WORK MODIFICATIONS																	
DW-1 NOZZLES DUCTWORI INSULATION DW-2 DUCTWORI STRUCTU ACCESS &  DW-4 DUCTWORI  Injection S  EQUIPMENT Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracit Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac				<u> </u>						ļ								
DUCTWORL INSULATION INSULATION INSULATION INSULATION STRUCTU ACCESS &  DW-4  DUCTWORL  Injection S  EQUIPMENT Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection M System Pip 8" - CS Piping Insulation Valves Supply Pip Water Sulation Air Suppl Piping Sup Piping Race  "IS-2  FOUNDATION  INSULATION INSUL	GAS DUCT TO ACCEPT INJECTION					,					•							
INSULATION  DW-2 DUCTWORN STRUCTU ACCESS &  DW-4 DUCTWORN  Injection S  EQUIPMENT Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Traci Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	S WORK MODS		Est	1	TN	2,625.00	2,625		35.00		35	FLDU	89.66	3,138				5,800
DW-2 DUCTWORI STRUCTU ACCESS &  DW-4 DUCTWORI  Injection S  EQUIPMENT Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Traci Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	ATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40	1,680		0.27	54	54		59.32	3,203				4,900
STRUCTU ACCESS &  DW-4  DUCTWORI  Injection S  EQUIPMENT Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Traci Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac			. , .															
Injection S  EQUIPMENT Air Blowers VFD Rotar Long-Term Days), Unit Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Traci Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	ORK SUPPORT STRUCTURES					100000			1000	J		0707	00.46					J
DW-4 DUCTWORI  Injection S  EQUIPMEN' Air Blowers VFD Rotar Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Traci Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	CTURAL STEEL		Est	5	TN	1,890.00 31.50			16.00 0.40	80	80	STST GALL	86.46 71.2	6,917 11,392				16,400 24,000
EQUIPMENT Air Blowers VFD Rotar Long-Term Days), Unit Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracit Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	SS & GALLERIES		Est	400	SF	31.50	12,000		0.40	100	100	GALL	/ 1.2	11,392				24,000
EQUIPMENT Air Blowers VFD Rotar Long-Term Days), Unit Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracit Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	ORK SUBTOTAL						26,355		·		329			24,650				51,100
EQUIPMENT Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracit Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac																		
Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N: System Pip 8" - CS Piping Insu Heat Tracit Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	on System													·				***************************************
Air Blowers VFD Rotar  Long-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracit Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	MENT/COMPONENTS																	
Short-Term Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Traci Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac		150 hp each	Est	6	EA	55,125.00			105.00			PUMP	65.83	41,473				372,200
Long-Term Days), Unit Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Traci Valves Supply Pip Water Su Air Suppl Piping Sup Piping Sup Piping Rac	otary Feeder	3 hp - Stainless Steel	Est	3	EA	10,500.00	31,500		30.00	90	90	TANK	65.78	5,920				37,400
Days), Unit  Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracit Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	Characa Cila Common for 2 Unito (10	2,687,900 lb full - 11,610 ft <sup>3</sup> -				· · · · · · · · · · · · · · · · · · ·		·										
Short-Term Injection M Injection N System Pip 8" - CS Piping Insu Heat Tracii Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	Ferm Storage Silo - Common for 2 Units (10 Unit cost is split between Units 3 and 4	D=20.7' - H=83.0' - CS Silo - SS Hopper	Est	1	EA	590,000.00	590,000		1624.00	1,624	1,624	TANK	65.78	106,827				696,800
Injection M Injection N Injection N System Pip 8" - CS Piping Insu Heat Traci Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	Onit cost is split between Onits 3 and 4	268,800 lb full - 1,160 ft <sup>3</sup> -												,				
Injection M Injection N Injection N System Pip 8" - CS Piping Insu Heat Traci Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac		D=8.7' - H=39.0' - CS Silo - SS					400.000		400.00	400	400	TANK	05.70	7.004				
Injection N System Pip 8" - CS Piping Insu Heat Traci Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	Term Storage Silo - (24 Hours)	Hopper	Est	1	EA	180,000.00 10,500.00			120.00 240.00	120 480	120	TANK MECH	65.78 66.86	7,894 32,093				187,900 53,100
System Pip 8" - CS Piping Insu Heat Tracii Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	on Manifold (2 Qty)	Stainless Steel	Est	2	EA LT	10,500.00			240.00			MECH		16,046				26,500
8" - CS Piping Insu Heat Traci Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	on Nozzles (50 Qty)	Stainless Steel	Est	1	L L I	10,500.00	10,500		240.00	2-10	2.10	WILCOIT	00.00	10,040				20,000
Piping Insu Heat Traci Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac		Includes fitting allowance	Est	350	LF	18.48	6,468		0.46	160	160	SPNG	70.4	11,236				17,700
Heat Tracii Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac	Insulation & Lagging	includes many anowance	Est	0	LF	6.62			0.14	0		INSUL	53.39	0				77,100
Valves Supply Pip Water Su Air Suppl Piping Sup Piping Rac			Est	0	LF	0.00			0.00	0	0	WIRE	69.06	0				
Supply Pip Water Su Air Suppl Piping Sup Piping Rac		Allowance	Est	1.	LS	1,050.00	1,050		24.75	25	25	SPNG	70.4	1,742				2,800
Water Su Air Suppl Piping Sup Piping Rac FIS-2 FOUNDATION					4													
Air Suppl Piping Sup Piping Rac Piping Rac FOUNDATION		Allowance	Est	0	LS	840.00			100.00	0	0	SPNG	70.4	<u> </u>				0
Piping Sup Piping Rad FOUNDATION		Allowance	Est	0	LS	525.00			80.00	0	0	SPNG	70.4	0				0
IS-2 FOUNDATION	Supports	Allowance	Est	1	LS	1,575.00			60.00 16.00	60 160	60	SPNG STST	70.4 86.46	4,224 13,834				5,800
		Allowance INCLUDES EXCAVATION &	Est	10	TN	2,200.00	22,000											35,800
	ATIONS	BACKFILL	Est	90	CY	157.50			7.00	630		CONP	52.91	33,333				47,500
SIRUCIU	CTURAL STEEL		Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
IS-3 AUGER CAS	CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	2,200	LF	10.00	22,000		0.52	1,144	1,144	PILE	82.81	94,735				116,700
IS-4 IS SYSTEM	EM SUBTOTAL						1,253,018				5,522			383,190				1,636,000
									<b> </b>			-						
MATERIA	RIAL UNLOADING SYSTEM																	
ASH-1 TRUCK UNI	UNLOADING SYSTEM	Included in silo	Est	0	Set	105,000.00	0		1254.00	0	0	SPNG	70.4	0				0
AH-6 MATERIAL	IAL UNLOADING SYSTEM SUBTOTAL						0		S		0							

T					T T	Louis	ville Gas & E	lectric								E	stimate No.:	22009A
Corport 9	k Lundy <sup>LLC</sup>						Ghent Unit 3		<u> </u>								Project No.:	10584-022
Sargent a							Mitigation Sy										Date:	12/20/2005
ilica	go		<del> </del>				ption 5 - Tro										Rev Date	
_												-						1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co			<u> </u>			Lassiassilla	<b>1</b> 27		-		172772000
						-0	ONFIDENTIA	<del>\</del> L-	Wage Rates	~~~~			Louisville	, KT			Preparer:	
									Labor Produ	ctivity =			1				Reviewer:	
													ļ —					
<u>Item No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
									1									
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE		<del> </del>							***************************************								
		Double Ended Unit Substation with (2) 1MVA,																
	480V SWITCHGEAR	6.9-480V XFMR's	Est	1 1	EA	580,000.00			500.00	500	500	EHEA	53.92					607,000
	New Breaker at Existing 4160V Switchgear		Est	1	EA	63,000.00	63,000		100.00	100			53.92	5,392	<b></b>			68,400
	MCC		Est	2	EA	42,000.00	84,000		200.00 300.00	400 300	400 300		53.92 53.92	21,568 16,176			·	105,600 77,100
	Misc Electrical Equipment & Controls		Est	1	LS	60,900.00	60,900		300.00	300	300	EHEA	55.92	10,170				77,100
AP-2	GROUNDING		<u> </u>	-														
	Cable - 500kcmil GND		Est	2,000	├ LF	2.10	4,200		0.05	100	100	WIRE	69.06	6,906				11,100
	Grounding Rod		Est	12	EA	199.50	2,394	<u> </u>	4.00	48	48		82.81	3,975				6,400
	CABLE							<u> </u>				WUDE	60.00	0				1
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60		Routed in 5" Conduit	0.69 0.69	173	173	WIRE WIRE	69.06 69.06	11,913				15,600
	Power Cables for MCC's	3/C 500kcmil, 600kV	Est	250	LF LF	14.70 8.40	3,6/5	Routed in 3" Conduit Routed in 2" Conduit	0.69	88	88		69.06	6,043				8,100
	Power Cables for 480V Switchgear	3/C 4/0kcmil, 5kV	Est	250	<u> </u>	6.40	2,100	Routed in 1-1/2"	0.00	- 00	- 00	******	00.00	0,040				0,100
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30	0	Conduit	0.52	0	О	WIRE	69.06	О				
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #2/0, 600V	Est	150	LF	0.76		Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549	- A - Company -			700
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	LF	1.58		Routed in 3/4" Conduit	0.05	0	0	WIRE	69.06	0				(
	TOTAL CADIOS WOM MOS TO ESCAPE TO THE							Routed in 1-1/2"										
	Power Cables from MCC to Loads - 50 HP	3/C #4, 600V	Est	150	LF.	2.10		Conduit Routed in 1-1/2"	0.09	14	14	WIRE	69.06	932				1,200
	Dawer Cables from MCC to Loads 100UD	3/C #4/0, 600V	Est	150	LF	9.45		Conduit	0.50	75	75	WIRE	69.06	5,180	-			6,600
	Power Cables from MCC to Loads - 100HP Power Cables from MCC to Loads - 150HP	3/C #350, 600V	Est	300	LF.	10.50		Routed in 2" Conduit	0.69	207	207	WIRE	69.06	14,295				17,400
	Control Cables - Pumps	5/C #14, 600V	Est	150	LF	0.67		Routed in 3/4" Conduit	0.03	5	5	WIRE	69.06	332				400
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81	0	Routed in 1-1/2"	0.04	0		WIRE	69.06	0				(
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25		Routed in 3/4" Conduit	0.03	24	24	WIRE	69.06	1,657				1,800
	Data Highway Cable		Est	1,000	LF	3.15	3,150	Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210				5,400
			<u> </u>	<u> </u>	<u> </u>													
	RACEWAY			0.200	LF	2.06	4,733		0.19	446	446	ECND	49.67	22,163				26,900
	3/4" Conduit		Est Est	2,300 300	LF LF	4.67			0.19	446 85	85	ECND	49.67	4,232				5,600
	1-1/2" Conduit 2" Conduit		Est	550	LF	6.25			0.35	194	194	ECND	49.67	9,616				13,100
	3" Conduit		Est	900	LF	13.13	11,813		0.65	581	581	ECND	49.67	28,833				40,600
	5" Conduit		Est	0	LF	38.33			1.13	0	0	ECND	49.67	0				
																<u> </u>		
	DCS SYSTEM ADDITIONS			<b></b>		04 500 00	04 500		40.00	40	40	EHEA	53.92	2,157		<u> </u>		33,700
	Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	CUEN	53.92	2,137				33,700
AP-8	DCS PROGRAMMING/INTERFACE																	
	Interface Hardware		Est	1	EA	2,625.00			20.00	20		EHEC	59.36	1,187				3,800
	Programming /Interface		Est	1	LT	5,250.00			0.00	0	0	WIRE	69.06	0				5,300
i i									100.00									10.500
	LIGHTING ALLOWANCE		Est	1	LT	10,500.00	10,500		100.00	100	100	INEL	60.02	6,002				16,500
AP-10	ALIVII IADV DOWED SVSTEM / I.O. SUDTOTAL						879,964				3,538			198,278				1,078,300
. AP-11) 1.	AUXILIARY POWER SYSTEM / I&C SUBTOTAL			<del> </del>	1						,						:	

				T		Louis	ville Gas & E	lectric					T			E	stimate No.:	22009A
Sargent	& Lundy LLC						<b>Ghent Unit 3</b>										Project No.:	10584-022
^hica	ago						Mitigation Sy										Date:	12/20/2005
							ption 5 - Tro										Rev Date	
	Cost Type: Est = Estimated, Bid = Vendor quote				-		lagnitude Co										Run Date:	1/27/2006
					-	-0	ONFIDENTIA	\L-	Wage Rates			ļ	Louisville	, KY			Preparer:	
					<u> </u>		·		Labor Produ	activity =			1				Reviewer:	
Item No.	. <u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
	REINFORCING OF EXISTING EQUIPMENT	NONE									-	1.						
	DEMOLITION / RELOCATIONS	NONE																
<u> </u>	MISCELLANEOUS	NONE														· · · · · · · · · · · · · · · · · · ·		
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,150.00	3,150		1170.00	1,170	1,170	PNTR	55.58	65,029				68,20
MISC-2	ROADWORK		Est	0	LS	36,750.00			380.00	0	0	PBIT	. 62.43	0				
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4																	2	
L	BLOWER HOUSE				<u> </u>						- A CONTRACTOR OF THE PARTY OF							
	PREFAB BLDG (15' x 20' )	INCLUDES EXCAVATION &		1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,20
	FOUNDATIONS	BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,20
MISC-5	CFD MODEL STUDY		Est	1	LS	30,000.00			40.00	40		STST	86.46	3,458				33,50
	TANK BERM		Est	1	LS	0.00			260.00	260		STST	86.46	22,480				22,50
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	0.00	0		60.00	60	60	STST	86.46	5,188				5,20
MISC-5	MISC. SUBTOTAL						82,438				2,135			132,244				214,700
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,000
	SUBTOTAL						2,241,774			0	11,524			838,362				3,080,100
	Craft Support During Startup Allowance for Premium Time Labor Productivity Loss Due To Overtime Per Diem Expense	At 3% of Total Manhours									346	MECH	66.86	23,115				23,100 Not Included Not Included Not Included
	Project Wrap (Efficacy) Insurance Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs																Not Included 154,000
	Erection Contractor's Profit	At 8% of Material and Labor Costs																246,400
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs															ł	Included w\Equipment Costs

						Louis	ville Gas & E	lectric								E	Estimate No.:	: 22009A
Sargent & Lun	ndy <sup>LLC</sup>						<b>Ghent Unit 3</b>										Project No.:	: 10584-022
Chicago						SO3	Mitigation S	/stem					<u> </u>				Date	: 12/20/2005
							ption 5 - Tro					1					Rev Date	
Cost	Type: Est = Estimated, Bid = Vendor quote				-		lagnitude Co		<del></del>				<del> </del>					: 1/27/2006
	Type: not - administration, ord - voludo quoto						ONFIDENTIA		Wage Rates	Daniel and		<u> </u>						
				ļ			ONFIDENTIA	<b>\L-</b>			-		Louisville	e, KY			Preparer:	
									Labor Produ	ctivity =							Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
																	E .	Included
Spec	cial Tools	Included w\Equipment Costs																w\Equipment Costs
		At 0.5% of																
Cons	sumables	Equipment/Material Cost					<u> </u>											11,20
F!-	-L4 T- Oil-	At 4.5% of			ŀ											g e e e e e e	l a r	
	ght To Site ss - Sales/Use/VAT/Business/Etc.	Equipment/Material Cost											ļ				ļ	100,90
	struction Utilities (Elect, Water, etc.) During			<b>!</b>	<b> </b>				-								<b></b> '	Not Included
	struction	Furnished by Owner																By Owner
SUB	TOTAL INSTALLED COST									0	11,870			861,477		-	1	3,615,70
	and the second s																	3,0,0,10
ENGINEERING	6 / CONSTRUCTION MANAGEMENT	Furnished by Project Team								0					-			361,60
	MODELING, ETC.									0								(
STARTUP REA	AGENT TESTING (15 DAYS)									0								50,00
CONTINGENC		At 20% of Total								0								805,500
TI IENT INTER		To Be Furnished by Owner								0								100,000
E PARTS	3							- ,		0								Not Included
ALATION		Not Included																
NIEREST DU	RING CONSTRUCTION (AFUDC)	Not Included																1
	IFOT TOTAL								ļ								1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1	
ILKO.	JECT TOTAL :						l			. 0							<u> </u>	4,932,80

			<del> </del>		T	Louis	ville Gas & E	lectric				T		T			stimate No.:	22010A
Sargent 8	k Lundy <sup>LLC</sup>						Ghent Unit						-				Project No.:	1
Chica							Mitigation S								1			12/20/2005
				:			- Vertical Fl								1.		Rev Date	
1	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate									Run Date:	1/27/2006
							ONFIDENTIA		Wage Rates	Based on:		-	Louisville	e, KY			Preparer	
							:		Labor Produ	uctivity =			1	1			Reviewer	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
	DUCTWORK MODIFICATIONS										:							
	MODIFY GAS DUCT FOR WESP AND TO ACCEPT INJECTION NOZZLES									r F								
	DUCTWORK MODS INSULATION & LAGGING		Est Est	0	TN SF	2,500.00 8.00	0		35.00 0.27	) C	) (	FLDU DINS	89.66 59.32		)			
DW-4	DUCTWORK SUPPORT STRUCTURES				1					1		<u> </u>						
	STRUCTURAL STEEL		Est	0	TN	1,800.00	0		16.00		) (	STST	86.46	6				
	ACCESS & GALLERIES		Est	0	SF	30.00	0		0.40			GALL	71.2					
DW-5	FOUNDATIONS FOUNDATIONS FOR DUCTWORK AND	INCLUDES EXCAVATION &																
	STRUCTURAL STEEL	BACKFILL	Est	0	CY	150.00	0		7.00	0	C	CONP	52.91	C				
	AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	0	LF	10.00	0		0.52	0	0	PILE	82.81	C				
٩	DUCTWORK SUBTOTAL					-	0				0			O				
	WESP & ASSOCIATED EQUIP																	
	WEST & ASSOCIATED EGOT				<u> </u>										1			
WE-1	long, total 150 SCA. All internal 2205, with 2205	INCLUDES ALL ASSOCIATED DUCTWORK AND WASTE WATER EQUIPMENT.PIPING AND TANKS	Est	1	EA	28,945,000.00		BUDGETARY INPUT FROM VENDORS	76901	76,901	76,901	PREC	86.72	6,668,871				35,613,90
WE-3	Chimney Liner Adjustment	RETURN TO EXISTING CHIMNEY	Est	0	LF	-5302.50	0		-55	О	0	PREC	86.72	0				
WE-4	Chimney Breaching Adjustment	NONE	Est	0	LS	0.00	0		0	0	0	PREC	86.72	0				
		INCLUDES EXCAVATION &							<b> </b>									
WE-5	FOUNDATIONS	BACKFILL	Est	210	CY	157.50	33,075		7.00	1,470	1,470	CONP	52.91	77,778				110,90
	AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	0	LF	10.00	0		0.52	0	0	PILE	82.81	0				
WE-7	FIBERGLASS DUCT			50	LF	7,200.00	360,000		50.00	2,500	2,500	DUCT	82.81	207,025				567,00
WE-8	WE SYSTEM SUBTOTAL						29,338,075				80,871			6,953,674				36,291,80
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE																	
	SWITCHGEAR	Double Ended Unit Substation with (2) 2MVA, 6.9- 480V XFMR's	Est	2	EA	575,000.00	1,150,000		500.00	1,000	1,000	EHEA	53.92	53,920				1,203,90
	New Breaker at Existing 13.2kV Switchgear MCC		Est Est	2	EA EA	63,000.00 52,500.00	126,000 105,000		100.00 240.00	200	200	EHEA EHEA	53.92 53.92	10,784				136,80 130,90

1					T	Louis	ville Gas & E	Electric	T	ļ-		<u> </u> -				· · · · · · · · · · · · · · · · · · ·	stimate No.:	22010A
Sargent	& Lundy <sup>LLC</sup>						Ghent Unit		-	<del> </del>			<b>_</b>				Project No.:	
Chica							Mitigation S										<del></del>	12/20/2005
					-		- Vertical Fl										Rev Date	
<b>-</b>	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co										Run Date:	1/27/2006
			<del>                                     </del>				ONFIDENTIA		Wage Rates	Based on:			Louisville	. KY			Preparer:	
			<del>                                     </del>						Labor Produ				1				Reviewer:	
. Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
	Misc Electrical Equipment & Controls		Est	1	LS	86,100.00	86,100		504.00	504	504	EHEA	53.92	27,176				113,300
													50.02					1 10,000
	GROUNDING		<u> </u>	0.000			1.55											0
	Cable - 500kcmil GND Grounding Rod		Est Est	2,000 12	LF EA	2.10 199.50			0.05 4.00		100	WIRE	69.06 82.81	6,906 3,975				11,100 6,400
	Grounding Flou		ESI	14	EN	199.50	2,394		4.00	48	48	FILE	02.81	3,9/5				6,400
	CABLE					. :	<u> </u>											
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	100	LF	33.60		Routed in 5" Conduit	0.69	69	69	WIRE	69.06	4,765				8,100
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	0	LF	14.70		Routed in 3" Conduit	0.69	0	0	WIRE	69.06	0				0
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	1,000	LF	8.40	8,400	Routed in 2" Conduit	0.35	350	350	WIRE	69.06	24,171				32,600
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	3,600	LF	6.30	20.600	Routed in 1-1/2" Conduit	0.52	1,872	4 070	WIRE	69.06	129,280				450,000
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #2/0, 600V	Est	3,600	LF LF	0.76		Routed in 3/4" Conduit	0.52	1,872	1,8/2	WIRE	69.06	129,280				152,000
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	1,500	LF	1.58		Routed in 3/4" Conduit	0.05	80	80	WIRE	69.06	5,490				7,900
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	0	LF	2.12		Routed in 1-1/2" Conduit	0.09	0	0	WIRE	69.06	0				0
	Towar dabled from Med to Edado 20 Bo Fil				<u> </u>			Routed in 1-1/2"	0.00	J		***************************************			-			
1	Power Cables from MCC to Loads - 50HP	3/C #4, 600V	Est	0	LF	2.67		Conduit	0.35	0	0	WIRE	69.06	0				0
	Power Cables from MCC to Loads - 60HP	3/C #2, 600V	Est	0	LF	3.58		Routed in 2" Conduit	0.35	0	0	WIRE	69.06	0				0
	Control Cables - Pumps	5/C #14, 600V	Est	1,500	LF	0.67	1,008	Routed in 3/4" Conduit Routed in 1-1/2"	0.03	48	48	WIRE	69.06	3,315				4,300
	Control Cables - TR Sets	7/C #14, 600V	Est	3,600	LF	0.81	2 911	Conduit	0.04	144	144	WIRE	69.06	9,945				12,900
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25		Routed in 3/4" Conduit	0.03	24		WIRE	69.06	1,657				1,800
	Data Highway Cable		Est	1,000	LF	3.15		Routed in 3/4" Conduit	0.03	32		WIRE	69.06	2,210				5,400
														. •				
	RACEWAY																	
	3/4" Conduit		Est	4,750	LF	2.06			0.19			ECND		45,771				55,500
	1-1/2" Conduit 2" Conduit		Est Est	3,600 1,000	LF LF	4.67 6.25	16,821 6,248		0.28 0.35	1,022 352	1,022	ECND ECND	49.67 49.67	50,783 17,484				67,600 23,700
1	3" Conduit		Est	0	LF	13.13			0.65	002		ECND	49.67	17,404				23,700
	5" Conduit		Est	100	LF	38.33			1.13	113		ECND	49.67	5,598			<u> </u>	9,400
																		2,.30
	DCS SYSTEM ADDITIONS																	
	Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,700
ADO	DOS DEOGRAMAMINO/INTERFACE	<u> </u>										•						
	DCS PROGRAMMING/INTERFACE Interface Hardware		Est	1	EA	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187				3,800
	Programming /Interface		Est	<u> </u>	LT	5,250.00	5,250		0.00	0	0	WIRE	69.06	1,107				5,300
						0,200.00	5,230		5.50									0,000
AP-9	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,800
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						1,609,556				7,569		-	441,458				2,051,200
	REINFORCING OF EXISTING																	
	EQUIPMENT	NONE						•						1				
	DEMOLITION / RELOCATIONS	NONE																•
┝┈╌	MICCELLANEOUS	NONE													-			
	MISCELLANEOUS	NONE								<u> </u>								
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	87150.00	87,150		3250.00	3,250	3 250	PNTR	55.58	180,635				267,800
		L. Laur. ap aria i rola i illioni				5, 100.00	27,100			5,255	0,200			. 55,555				207,000

			T .		T	Louis	ville Gas & E	lectric	1	T	T	T.	T			1	Estimate No.	220104
Sargent &	& Lundy <sup>LLC</sup>						Ghent Unit 3						+				Project No.	
Chica	go						Mitigation Sy							***************************************			+	: 12/20/2005
							- Vertical Flo										Rev Date	
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate									Run Date:	1/27/2006
				la a s		-0	ONFIDENTIA	AL-	Wage Rates	Based on:			Louisville	, KY			Preparer	:
-									Labor Produ	ctivity =			1				Reviewer	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
MISC-2	ROADWORK	20' WIDTH X 1000 LF GRAVEL	Est	1	LS	46000.00	46,000		380.00	200	390	DDIT	60.40	00.700				
	STORM DRAINAGE	GRAVEL	Est		LS	7350.00	·						62.43					69,70
			Lot			7350.00	7,350	,	300.00	300	300	YDRN	51.97	15,591				22,90
MISC-4	OTHER																	
MICO	MICO CURTOTAL						140 500											
MIIOC-5	MISC. SUBTOTAL			<u> </u>			140,500	1	1		3,930			219,949				360,40
										Mark the second								
MISC-1	PAINTING	Touch-up and Field Finish	Est	0	LS		0		3250.00	0	0	PNTR	55.58	0				
MISC-2	ROADWORK	20' WIDTH X 1000 LF GRAVEL	Est	0	LS	www.common.com	0		475.00	0	0	PBIT	62.43	0				
MICC-3	STORM DRAINAGE		Est	0	LS		0	-	538.43	0	0	YDRN	51.97	0				
-4	OTHER											-						
MISC-5	CFD MODEL STUDY		Est	1	LS	0.00	0,		40.00	40	40	STST	86.46	3,458			:	3,50
MISC-5	MISC. SUBTOTAL						0				40			3,458				3,50
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				400.00
GG-1	MOBILIZATION / DEMOBILIZATION		Lot				0							100,000				100,000
GS-2	CRANE RENTAL	700 Ton - 4 months	Est	1	LT			Includes freight in and out						480,000				480,000
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			580,000				580,000
	SUBTOTAL						31,088,131			0	92,410			8,198,540				39,286,900
	Craft Support During Startup	At 3% of Total Manhours									2 772	MECH	66.86	185,357				185,400
	Allowance for Premium Time Labor	. a o /o o. Total marmodio											50.00	100,007				Not Included
	Productivity Loss Due To Overtime																	Not Included
	Per Diem Expense Project Wrap (Efficacy) Insurance																	Not Included Not Included
	Erection Contractor's General & Administrative	At 5% of Material and Labor																
	Costs Erection Contractor's Profit	Costs - WESP At 8% of Material and Labor														4		517,100
	Mandatory Spare Parts (Start-up/Testing)	Costs - WESP  Included w\Equipment Costs																827,400 Included w\Equipment Costs Included
	Special Tools	Included w\Equipment Costs At 0.5% of						· · ·										w\Equipment Costs
	Consumables	Equipment/Material Cost																155,400

			· · · · · · · · · · · · · · · · · · ·									-						
						Louis	ville Gas & E	Electric			:					E	stimate No.	: 22010A
Sargent &	& Lundy <sup>LLC</sup>						<b>Ghent Unit 3</b>	3									Project No.	.: 10584-022
Chica					-	SO3	Mitigation S	vstem					<u> </u>					: 12/20/2005
							- Vertical Fl		1								Rev Date	1220/2000
	Cost Type: Est = Estimated, Bid = Vendor quote			-			lagnitude Co		-		+		-		<del> </del>			
	, , , , , , , , , , , , , , , , , , , ,		ļ	-	+							<u> </u>					<del> </del>	: 1/27/2006
			-				ONFIDENTIA	AL-	Wage Rates				Louisville	e, KY			Preparer	
									Labor Produ	ctivity =			•	1			Reviewer	:
<u>Item No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR_ (Furnish)	DOR (Install)	<u>Total</u> Projected Cost
	Freight To Site Taxes - Sales/Use/VAT/Business/Etc.	At 4.5% of Equipment/Material Cost																1,399,000
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner				-												Not Included  By Owner
	SUBTOTAL INSTALLED COST		<u> </u>	<u> </u>							95,183			8,383,896				42,371,200
											35,165			0,303,030				42,371,200
ENGINEE	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team								C	)							1,906,700
PERMITT	ING, MODELING, ETC.							***************************************		C								1,000,700
	P AND TESTING									C				•				100,000
CONTING		At 20% of Total								C								8,875,600
	NTERNAL COST	To Be Furnished by Owner		<u> </u>						C							***************************************	200,000
SPARE P		<b>_</b>		1						0	4							Not Included
ESCALAT		Not Included		ļ												1		
INTERES	T DURING CONSTRUCTION (AFUDC)	Not Included																C
	PROJECT TOTAL :			<b> </b>														
لنب	PROJECT TOTAL:		L							0								53,453,500

Sargent & L cago Co		Scope Definition				SO3 Option 7 - Order of M	ville Gas & E Ghent Unit 4 Mitigation Sy Horizontal F agnitude Co ONFIDENTIA	vstem Iow WESP		:							Rev Date	12/20/2005
Co	ost Type: Est = Estimated, Bid = Vendor quote	Scope Definition				SO3 Option 7 - Order of M	Mitigation Sy Horizontal F agnitude Co	stem low WESP									Rev Date	
Co	ost Type: Est = Estimated, Bid = Vendor quote	Scope Definition				Option 7 - Order of M	Horizontal F agnitude Co	low WESP										
		Scope Definition				Order of M	agnitude Co							<del> </del>			Run Date:	<del> </del>
		Scope Definition						ot Lotiniato				ł	i	1	1			1/27/2006
Item No.	<u>Description</u>	Scope Definition				-0		M _	Wage Rates	Based on:			Louisville	KY			Preparer:	
Item No.	<u>Description</u>	Scope Definition					ON IDENTIF	\L-	Labor Produ				1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition							Euso: 11000	, –							11017017017	
Item No.	<u>Description</u>	Scope Definition																
			Cost Type	Quantity	<u>Unit of</u> <u>Measure</u>	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cost</u>
D	DUCTWORK MODIFICATIONS	COSTS																
					-													
<u></u>	WESP & ASSOCIATED EQUIP				<u> </u>						<u> </u>							
					in and													
fe pa 1 <sup>-</sup> in	passages, and 11 feet long 2nd and 3rd fields at 11.75" spacing with 64 passages, total 170 SCA. All nternal 2205, with 2205 carbon steel clad alloy plate	INCLUDES ALL ASSOCIATED DUCTWORK AND WASTE WATER EQUIPMENT,PIPING AND TANKS	Est	- 1	EA	30,490,000.00		BUDGETARY INPUT FROM VENDOR	142817	142,817	142,817	PREC	86.72	12,385,047				42,875,000
	Chimney Liner Adjustment ( WITH MODIFIED	RETURN TO EXISTING																
WE-2 B		BREECHING	Est	0	LF	5,302.50	0		55	0	0	PREC	86.72	0				0
WE-2	SHEEGHING AT WEST COTEL! ELEVATION)											DDEO	00.70					
V C	Chimney Breaching Adjustment		Est	0	LS	21,000.00	0		220	9	-0	PREC	86.72	0				0
1 1						04 000 00	21,000		100.00	100	100	STST	86.46	8,646				29,600
WE-4 E	Electrical Building	20'x40'	Est	1	EA	21,000.00	21,000		100.00	100	100	0101	00.40	0,040				29,000
		INCLUDES EXCAVATION &		ļ									1					
	-0.13.DATIONS	BACKFILL	Est	810	CY	157.50	127,575	:	7.00	5,670		CONP	52.91	300,000				427,600
	FOUNDATIONS STRUCTURAL STEEL	BACKFILL	Est	170	TN	2,200.00	374,000		16.00	2,720	2,720	STST	86.46					609,200
	AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	2,000	LF	10.00			0.52	1,040	1,040		82.81	86,122				106,100
	FIBER GLASS DUCT 23' DIA		Est	450	LF	7,200.00			50.00	22,500	22,500 <b>174,847</b>	DUCT	59.32	1,334,700 <b>14,349,686</b>				4,574,700 <b>48,622,200</b>
	WE SYSTEM SUBTOTAL						34,272,575				174,047			14,545,000				40,022,200
1	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1 P	POWER SOURCE																	
	SWITCHGEAR	Double Ended Unit Substation with (2) 2MVA, 6.9- 480V XFMR's	Est	1	EA	575,000.00			500.00	500	500 100	EHEA EHEA	53.92	26,960 5,392				602,000
F	New Breaker at Existing 13.2kV Switchgear		Est	1 1	EA	63,000.00 52,500.00			100.00 240.00	100 480	480	EHEA	53.92 53.92					68,400 130,900
N	MCC		Est	2	LS	52,500.00 86,100.00			324.00	324	324	EHEA	53.92	17,470				103,600
N	Misc Electrical Equipment & Controls		Est	1	Lo	50,100.00	30,100							-,,				
LAD A	GROUNDING																	
	Cable - 500kcmil GND	1 1 2	Est	2,000	LF	2.10			0.05	100	100	WIRE	69.06	6,906				11,100
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,400
			<b></b>		-				<del> </del>									
	CABLE	3/C 750kcmil, 5kV	Est	100	LF	33.60	3.360	Routed in 5" Conduit	0.69	69	69	WIRE	69.06	4,765		-1		8,100
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	14.70	0	Routed in 3" Conduit	0.69	0	0	WIRE	69.06	0				-0
	Power Cables for MCC's Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	1,000	LF	8.40		Routed in 2" Conduit	0.35	350	350	WIRE	69.06	24,171				32,600
	Fuwer Cables for Switchigear						.= .==	Routed in 1-1/2"	ا ا	1 212		WIDE	ام مما	86,187				101 000
l Ir	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	2,400	LF LF	6.30		Conduit Routed in 3/4" Conduit	0.52 0.05	1,248	1,248	WIRE WIRE	69.06 69.06	86,187		~~		101,300
T F	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	1 500	LF LF	0.76 1.58		Routed in 3/4" Conduit	0.05	80	80	WIRE	69.06	5,490	-			7,900
F	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	1,500	<u> </u>	1.50	2,000	Routed in 1-1/2"	5.55					-,				- ,,,,,,,
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	0	LF	2.12	. 0	Conduit	0.09	0	0	WIRE	69.06	o				0

						Louis	ville Gas & E	lectric	<u>[</u> :							Æ	stimate No.:	22011A
	LLC						Ghent Unit 4		1								Project No.	
Sargent &	Lundy <sup>LLC</sup>						Mitigation Sy		1								ļ	12/20/2005
`icag	go					Option 7 -	Horizontal F	low WESP									Rev Date	
	Cont. Times Fat Catimeted Bid Wander must						agnitude Co		1								Run Date:	1/27/2006
	Cost Type: Est ≠ Estimated, Bid = Vendor quote						ONFIDENTIA		Wage Rates	Based on:			Louisville	KY			Preparer	
									Labor Produ	ctivity =			1				Reviewer	
1																		
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Co</u>
								Routed in 1-1/2"										
		0/0 //4 500)/	Est	0	LF	2.67		Conduit	0.35	0	0	WIRE	69.06	0				
		3/C #4, 600V 3/C #2, 600V	Est	0	LF	3.58		Routed in 2" Conduit	0.35	Ŏ	0	WIRE	69.06	0	***************************************			
		5/C #2, 600V 5/C #14, 600V	Est	1,500	LF	0.67		Routed in 3/4" Conduit		48	48		69.06	3,315			***************************************	4,30
	Control Cables - Fulfips	3/0 // 14, 000 1						Routed in 1-1/2"										
	Control Cables - TR Sets	7/C #14, 600V	Est	2,400	LF	0.81		Conduit	0.04	96	96	WIRE	69.06	6,630		·		8,60
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25 3.15		Routed in 3/4" Conduit Routed in 3/4" Conduit	0.03 0.03	24 32		WIRE WIRE	69.06 69.06	1,657 2,210			<u> </u>	1,80 5,40
	Data Highway Cable		Est	1,000	LF LF	3.15	3,150	nouted in 3/4 Conduit	0.03	32	32	WILLE	09.00	2,210				5,40
100	DACEWAY																	
	RACEWAY 3/4" Conduit		Est	4,750	LF	2.06			0.19	922		ECND	49.67	45,771				55,50
	1-1/2" Conduit		Est	2,400	LF	4.67	11,214		0.28	682	682	ECND	49.67	33,855				45,10
	2" Conduit		Est	1,000	LF	6.25			0.35	352	352	ECND	49.67	17,484				23,70
	3" Conduit	The state of the s	Est	0	LF	13.13 38.33			0.65 1.13	113	112	ECND ECND	49.67 49.67	5,598				9,40
	5" Conduit		Est	100	LF	30.33	3,633		1.10	110	110	LOND	43.07	3,330				3,40
AP-5	DCS SYSTEM ADDITIONS Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,70
					-													
	DCS PROGRAMMING/INTERFACE		Est	1 1	EA	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187				3,80
	Interface Hardware Programming /Interface		Est	1	LT	5,250.00			0.00	0	0	WIRE	69.06	0				5,30
ļ	1 logianiming /interlace								450.00	450	150	INEL	60.02	9,003				04.00
AP-9	LIGHTING ALLOWANCE		Est	11	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,80
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						957,418				5,776			336,065				1,293,70
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE												-				
									0077.55					400.00=				
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	87,150.00	87,150		3250.00	3,250	3,250	PNTR	55.58	180,635				267,80
NICO -	DOADIMORK	20' WIDTH X 1000 LF GRAVEL	Est	1	LS	45,937.50	45,938	e e e e e e e e e e e e e e e e e e e	380.00	380	380	PBIT	62.43	23,723	<u> </u>			69,70
MISC-2	ROADWORK	GNAVEL	Lot									,						
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
				<u> </u>	-				1									
MISC-4	OTHER			1														
MISC-5	MISC. SUBTOTAL						140,438				3,930			219,949				360,400
					1	0.00			40.00	40	40	STST	86.46	3,458				3,500
-5	CFD MODEL STUDY		Est	1	LS	0.00	0		40.00	40	40	5151	50.40	3,430				3,500
	OFNEDAL OURSORT		1															
	GENERAL SUPPORT		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		The second second												•	
	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000

						Louis	ville Gas & E	lectric								E	stimate No.	.: 22011A
Carmont 9	k Lundy <sup>LLC</sup>						Ghent Unit 4										Project No.	.: 10584-022
Sargent a						SO3	Mitigation S	ystem									Date	: 12/20/2005
ilca	go						Horizontal F										Rev Date	
	O I T				<b> </b>		agnitude Co		1								Run Date	: 1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						ONFIDENTI		Wage Rates	Based on:			Louisville	, KY			Preparer	
		Acres Control of the			ļ				Labor Produ		<u> </u>		1	<u> </u>			Reviewer	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Instali)	<u>Total</u> Projected Cost
												2						
								Includes freight in and										
GS-2	CRANE RENTAL	700 Ton - 2 months	Est	1	LT			out						310,000				310,000
G0-2	ONAINE NENTAL	700 1011 2 monus																
GS-2	GENERAL SUPPORT SUBTOTAL						<u> </u>		<u> </u>		°	<b></b>	<u> </u>	410,000				410,000
					<u> </u>		35,370,431				184,593			15,319,159				50,689,800
	SUBTOTAL						33,370,431				104,555			10,010,100				0
	Craft Support During Startup	At 3% of Total Manhours			1						5,538	MECH	66.86	370,256				370,300
	Allowance for Premium Time Labor	At 576 of Total Manifester																Not Included
	Productivity Loss Due To Overtime																	Not Included
	Per Diem Expense															ļ		Not Included
	Project Wrap (Efficacy) Insurance																<u></u>	Not Included
	Erection Contractor's General & Administrative	At 5% of Material and Labor							· .									1,010,000
	Costs	Costs - WESP At 8% of Material and Labor																1,010,000
	Erection Contractor's Profit	Costs - WESP									*							1,616,000
<u> </u>		COSIS - WEOI																Included
				1.														w\Equipment
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs			-													Costs Included
																		w\Equipment
İ		L. L. L. J. A. E. vinne ant Coats																Costs
	Special Tools	Included w\Equipment Costs At 0.5% of		1	<u> </u>								1					
	Consumables	Equipment/Material Cost														4		176,900
	Consumables	At 4.5% of																
	Freight To Site	Equipment/Material Cost					,											1,591,700
	Taxes - Sales/Use/VAT/Business/Etc.																	Not Included
	Construction Utilities (Elect, Water, etc.) During		1															By Owner
	Construction	Furnished by Owner	<del> </del>						1					<u> </u>				Dy CMIICI
	CURTOTAL INCTALLED COST		<u> </u>							0	190,131			15,689,415				55,454,700
	SUBTOTAL INSTALLED COST																	
ENGINE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team								0					***************************************			2,495,000
PERMIT	TING, MODELING, ETC.									0						<b> </b>		100 000
STARTU	P AND TESTING									0								100,000 11,609,900
CONTING	GENCY	At 20% of Total			<b>_</b>					0				-				200,000
	NTERNAL COST	To Be Furnished by Owner	<b>_</b>	<u> </u>	-	1				0								Not Included
SPARE F		Not Included		-	-				<b> </b>									0
ESCALA	HUN	Not Included  Not Included																0
INTERES	ST DURING CONSTRUCTION (AFUDC)	TAOL HIGIGGE																
	PROJECT TOTAL:			1						0								69,859,600

						Louis	ville Gas & E	Electric		1		T	T		T	T		1
Sargen	t & Lundy <sup>LLC</sup>				<del> </del>	Louis	Ghent Unit						-				Estimate No.	
Chic	eago					603						1	-				Project No.	10584-022
				-	<del> </del>		Mitigation S					1				-	Date	12/20/2005
	Cost Type: Est = Estimated, Bid = Vendor quote				-		n 1 - Hydrate										Rev Date	1/27/2006
<u> </u>	, see a feet of the see a feet		-				agnitude Co										Run Date	1/27/2006
		f.				-C	ONFIDENTIA	AL-	Wage Rates	Based on:			Louisville	, KY			Preparer	:
									Labor Produ	uctivity =			1				Reviewer	:
Item No	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	<u>Crew</u> <u>Code</u>	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Co</u>
	DUCTWORK MODIFICATIONS																	
	HODIEVO											ļ						
DW-1	MODIFY GAS DUCT TO ACCEPT INJECTION NOZZLES							and the same of th										
	DUCTWORK MODS		<b> </b>									l						l
	INSULATION & LAGGING	3 1/2" INSUL	Est	1 200	TN	2,625.00	2,625		35.00		35	FLDU	89.66	3,138				5,80
		O 1/2 INGOL	Est	200	SF	8.40	1,680		0.27	54	54		59.32	3,203				4,90
DW-2	DUCTWORK SUPPORT STRUCTURES		1									ļ						
	STRUCTURAL STEEL		Est	5	TN	1,890.00	9,450		16.00	80	80	STST	86.46	6.017				
*	ACCESS & GALLERIES		Est	400	SF	31.50	12,600		0.40	160	160	GALL	71.2	6,917 11,392		***************************************	<b></b>	16,40 24,00
				* * * * * * * * * * * * * * * * * * * *									,,,,	11,002				24,00
DW-4	DUCTWORK SUBTOTAL																	
			-				26,355				329			24,650				51,10
	Injection System																	
					7													
S-1	EQUIPMENT/COMPONENTS																	
-	Air Blowers	150 hp each	Est	5	EA	55,125.00	275,625		105.00	525	525	PUMP	65.83	34,561				210.00
	VFD Rotary Feeder	3 hp - Stainless Steel	Est	3	EA	10,500.00	31,500		30.00	90		TANK	65.78	5,920				310,20 37,40
	Long-Term Storage Silo - Common for 2 Units (10	2,937,600 lb full - 19,615 ft <sup>3</sup> - D=20.5' - H=82.0' - CS Silo - SS			. 44									0,020				37,40
***************************************	Days), Unit cost is split between Units 3 and 4	Hopper	Est	1	EA	808,000.00	808,000		2545.52	2,546	0.546	TANK	65.78	107.444				
		293,760 lb full - 1,920 ft <sup>3</sup> -					300,000		2040.02	2,540	2,540	IAINK	05.76	167,444				975,40
	Short-Term Storage Silo - (24 Hours)	D=8.5' - H=38.0' - CS Silo - SS Hopper	Est	4	Ε.Λ	200 200 20	222 222											
	Injection Manifold (2 Qty)	Stainless Steel	Est	2	EA EA	200,000.00 10,500.00	200,000 21,000		764.00		764	TANK	65.78	50,256				250,30
	Injection Nozzles (50 Qty)	Stainless Steel	Est	1	LT	10,500.00	10,500		240.00 240.00	480 240	480	MECH MECH	66.86 66.86	32,093				53,10
	System Piping						.0,000		240.00	240	240	MECH	00.00	16,046				26,50
	8" - CS	Includes fitting allowance	Est	350	LF	18.48	6,468		0.46	161	161	SPNG	70.4	11,334				17,80
	Piping Insulation & Lagging Heat Tracing		Est	0	LF	6.62	0	*·····································	0.14	0		INSUL	53.39	0				17,00
	Valves	Allowance	Est	0	LF	0.00	0		0.00	0	0	WIRE	69.06	0				
	Supply Piping	Anowance	Est	1	LS	1,050.00	1,050		24.75	25	25	SPNG	70.4	1,742				2,800
	Water Supply	Allowance	Est	0	LS	840.00									1			
		Allowance	Est	0	LS	525.00	9		100.00	0		SPNG	70.4	0				(
	Piping Supports	Allowance	Est	1	LS	1,575.00	1,575		80.00	0		SPNG	70.4	0				
	Piping Rack	Allowance	Est	10	TN	2,200.00	22,000		60.00 16.00	60 160	60 160	SPNG STST	70.4 86.46	4,224 13,834				5,800
6-2	FOUNDATIONS	INCLUDES EXCAVATION &							10.00	100	100		50.40	13,034				35,800
6-3	STRUCTURAL STEEL	BACKFILL	Est	50	CY	157.50	7,875		7.00	350	350	CONP	52.91	18,519				26,400
		100 ft LONG	Est Est	10 2,200	TN LF	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
			LOI	۷,۷۰۰		10.00	22,000		0.52	1,144	1,144	PILE	82.81	94,735				116,700
-5	S SYSTEM SUBTOTAL						1,429,593				6,704			464,542				4 004 000
	MATERIAL LINE CARING CYCTEM						, , , , , , , , , , , , , , , , , , , ,				0,704			404,042				1,894,000
	MATERIAL UNLOADING SYSTEM																	***************************************
SH-1	TRUCK DELIVERY	INCLUDED IN SILO																
	AUXILIARY POWER SUPPLY	INOTODED IN SITO	Est	0	Set	315,000.00	0		1753.67	0	0	SPNG	70.4	0				
	SYSTEM/I&C			ľ	ŀ	1			l	1	1							
									<u> </u>									
P-1 F	POWER SOURCE																	

			T -	T		l auto	villa Caa 9 F		T	Т .	T		<del></del>	T	T	7		
Sargent	t & Lundy <sup>LLC</sup>					Louis	ville Gas & E Ghent Unit										Estimate No.	
Chic						503	Mitigation S					-					Project No.	
							n 1 - Hydrate						-		-			12/20/2005
	Cost Type: Est = Estimated, Bid = Vendor quote		ļ							ļ		-						1/27/2006
			·	<del> </del>			agnitude Co					<u> </u>					Run Date	: 1/27/2006
						<u>-C</u>	ONFIDENTI	AL-	Wage Rates				Louisville	e, KY			Preparer	
			ļ	-					Labor Produ	ictivity =		<del> </del>	1			-	Reviewer	:
										-				1			<u> </u>	
Item No	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	Total Projected Co
<u> </u>		Double Ended Unit Substation																
		with (2) 2MVA, 6.9-480V															1	
1	480V SWITCHGEAR	XFMR's	Est	1	EA	E75 000 00	575,000											
	New Breaker at Existing 6900V Switchgear	7	Est	1 1	EA	575,000.00 63,000.00	63,000		500.00 100.00		500	EHEA	53.92	26,960				602,00
	MCC		Est	2	EA	42,000.00	84,000		200.00	400	100	EHEA EHEA	53.92 53.92	5,392 21,568			<u> </u>	68,40
	Misc Electrical Equipment & Controls		Est	1	LS	60,900.00	60,900		300.00		300	EHEA	53.92				<del> </del>	105,60 77,10
ABO	GROUNDING								1	l	300		1 30.32	10,170				17,10
AP-2	GROUNDING Cable - 500kcmil GND											1	1					
	Grounding Rod		Est	2,000	LF	2.10	4,200		0.05	100	100	WIRE	69.06					11,10
<b> </b>			Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,40
AP-3	CABLE			<u> </u>								<u> </u>						
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60		Davidad in 51 Occal is										
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.70		Routed in 5" Conduit Routed in 3" Conduit	0.69		170	WIRE	69.06				ļ	
	Power Cables for 480V Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.40		Routed in 2" Conduit	0.69 0.35	173	173	WIRE WIRE	69.06 69.06	11,913				15,60
						0.70		Routed in 1-1/2"	0.33	U		WIRE	69.00	- 0			ļ	
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30		Conduit	0.52	0	0	WIRE	69.06	0		·		
ļ	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	150	LF	0.76		Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549				70
ŀ —	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	150	LF	1.58	236	Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549				80
	Power Cables from MCC to Loads - 50 HP	3/C #4, 600V	Est	150	LF	0.40	0.15	Routed in 1-1/2"										
	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	0/0 #4, 0000	LSI	130	LF	2.10	315	Conduit Routed in 1-1/2"	0.09	14	14	WIRE	69.06	932				1,20
	Power Cables from MCC to Loads - 100HP	3/C #4/0, 600V	Est	150	LF	9.45	1 /19	Conduit	0.50	75	7.5	WIRE	00.00	5 400				
	Power Cables from MCC to Loads - 150HP	3/C #350, 600V	Est	300	LF	10.50		Routed in 2" Conduit	0.50	75 207	75 207		69.06 69.06					6,60
	Control Cables - Pumps	5/C #14, 600V	Est	150	LF	0.67		Routed in 3/4" Conduit	0.03	5	5	WIRE		332				17,40 40
								Routed in 1-1/2"										40
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81	0	Conduit	0.04	0	0	WIRE	69.06 69.06	0				
	Instrumentation Cables Data Highway Cable	2 PR #16 SHLD	Est	750	LF	0.25		Routed in 3/4" Conduit	0.03	24	24	WIRE	69.06	1,657				1,80
	Data Flighway Cable		Est	1,000	LF	3.15	3,150	Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210				5,40
AP-4	RACEWAY																	
	3/4" Conduit		Est	2,300	LF	2.06	4,733		0.10	446	446	FOND	40.07	00.400				
	1-1/2" Conduit		Est	300	LF	4.67	1,402		0.19 0.28	446 85	446	ECND ECND	49.67 49.67	22,163 4,232				26,90
	2" Conduit		Est	300	LF	6.25	1,874		0.26	106	106	ECND	49.67	4,232 5,245				5,60 7,10
	3" Conduit		Est	900	LF	13.13	11,813		0.65	581	581	ECND	49.67	28,833				40,60
	5" Conduit		Est	0	LF	38.33			1.13	0	0	ECND	49.67	0				40,00
AP-5	DCS SYSTEM ADDITIONS															***************************************	***************************************	
	Cabinets		F-4			04 = 22 = 1												
			Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,700
AP-8	DCS PROGRAMMING/INTERFACE																	
	Interface Hardware		Est	1	EA	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187				0.00
	Programming /Interface		Est	1	LT	5,250.00	5,250		0.00	20		WIRE	69.06	1,167 A				3,800 5,300
	LIGHTING								5.55			77 II IL	33.00					5,300
AP-9	LIGHTING ALLOWANCE		Est	1	LT	10,500.00	10,500		100.00	100	100	INEL	60.02	6,002				16,500
			-															
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						871,538				3,370			188,413				1,060,00
	REINFORCING OF EVICTING																	
	REINFORCING OF EXISTING						ľ		1	4.2								
	<u>EQUIPMENT</u>	NONE					<u></u>				1	. 1						
	DEMOLITION / DEL COATIONS													:				
	DEMOLITION / RELOCATIONS	NONE		<u> </u>	<u> </u>												Y-1	

						Louis	ville Gas & E	lectric	T							E	stimate No.:	22012B
Sargent	& Lundy <sup>LLC</sup>						Ghent Unit 4										Project No.:	10584-022
Chica	igo						Mitigation Sy											12/20/2005
							n 1 - Hydrate										Rev Date	
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co											1/27/2006
						-C	ONFIDENTIA	AL-	Wage Rates				Louisville	e, KY	ļ		Preparer: Reviewer:	<u> </u>
-					<b> </b>				Labor Produ	ictivity =				!			neviewer	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
	MISCELLANEOUS	NONE																
	INIGCELEANEOUS	NONE									,							
	PAINTING	Touch-up and Field Finish	Est	1	LS	3,150.00	3,150		1170.00	1,170	1,170	PNTR	55.58					68,20
MISC-2	ROADWORK		Est	0	LS	36,750.00	0	·	380.00	0	0	PBIT	62.43	0				
MISC-3	STORM DRAINAGE		Est	0	LS	7,350.00	0		300.00	0	0	YDRN	51.97	7 0				
MISC-4	OTHER																	
	BLOWER HOUSE	INCLUDES EXCAVATION &																
	FOUNDATIONS PREFAB BLDG. 15'X20'	BACKFILL	Est Est	25 1	CY LS	157.50 38,000.00	3,938 38,000		7.00 130.00	175 130	175 130	CONP STST	52.91 86.46					13,20 49,20
MISC-5	CFD MODEL STUDY		Est	1	LS	30,000.00	30,000		40.00	40	40	STST	86.46	3,458				33,50
<u>6</u>	TANK BERM		Est	1	LS	0.00	0		260.00	260	260	STST	86.46	22,480				22,50
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	0.00	0		60.00	60	60	STST	86.46	5,188				5,20
MISC-5	MISC. SUBTOTAL						75,088				1,835			116,653				191,80
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							150,000				150,000
GS-2	GENERAL SUPPORT SUBTOTAL						0				0	7		150,000				150,000
	SUBTOTAL						2,402,574			0	12,238			944,258				3,346,90
	Craft Support During Startup Allowance for Premium Time Labor	At 3% of Total Manhours									367	MECH	66.86	24,548				24,500 Not Included
	Productivity Loss Due To Overtime Per Diem Expense																	Not Included Not Included
	Project Wrap (Efficacy) Insurance Erection Contractor's General & Administrative	At 5% of Material and Labor										-						Not Included
	Costs Erection Contractor's Profit	Costs At 8% of Material and Labor Costs																167,30 267,80
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs	-														•	Included w\Equipment Costs Included
	Special Tools	Included w\Equipment Costs At 0.5% of Equipment/Material																w\Equipment Costs
	Consumables	Cost At 4.5% of Equipment/Material																12,000
	Freight To Site Taxes - Sales/Use/VAT/Business/Etc.	Cost									7							108,100 Not Included

ſ						Louis	ville Gas & E	lectric								<u> </u>	Estimate No.:	: 22012B
Carrent	& Lundy <sup>LLC</sup>						<b>Ghent Unit 4</b>										Project No.	.: 10584-022
					<u> </u>	SO3	Mitigation Sy	/stem									Date	: 12/20/2005
_ Ca	igo						n 1 - Hydrate										Rev Date	1/27/2006
				-			lagnitude Co										Run Date	: 1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote								Wage Rates	Based on			Louisville	KV			Preparer	
						-(	ONFIDENTIA	<b>₹L-</b>					Louisville	, KI		<u> </u>	<u> </u>	
									Labor Produ	ictivity =			1				Reviewer:	-
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cost</u>
																	·	
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
				-					-	1	12,606			968,806				3,926,600
	SUBTOTAL INSTALLED COST		<b>_</b>		-				1		12,000							
ENGINE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team		<b> </b>						(								392,660
PERMIT	ΓING, MODELING, ETC.							;		(				,	-			0
STARTU	P, TESTING AND REAGENT (15 DAYS)								<b>_</b>							-		50,000
CONTIN		At 20% of Total																873,900
CLIENT I	NTERNAL COST	Furnished by Owner			<u> </u>				<u> </u>									100,000 Not Included
SPARE F	PARTS								<u> </u>								-	not included
<b>ESCALA</b>	TION	Not Included			ļ		<b>_</b>		1									1 0
INTERES	ST DURING CONSTRUCTION (AFUDC)	Not Included	<b></b>				<u> </u>		-									
									1	1							<u> </u>	5,343,160
	PROJECT TOTAL :		<u> </u>		1	1	1	L			<u> </u>	L	L		I			

						Louis	ville Gas & E	lectric	T		1			T		T .	Estimate No.:	22012B
Sargent 8	& Lundy LLC			<del> </del>		Louis	Ghent Unit 4										Project No.:	
Chica			<del> </del>			SO3	Mitigation S										<del></del>	<del> </del>
							- Magnesium					<del> </del>	-					12/20/2005
	Cost Type: Est = Estimated, Bid = Vendor quote		-	-					-			ļ	-				Rev Date	
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		<b>_</b>				Magnitude Co											1/27/2006
		# TIV TWO - WAS AND AND AND AND AND AND AND AND AND AND				-0	CONFIDENTIA	<b>4L-</b>	Wage Rates			ļ	Louisville	e, KY			Preparer:	
				+	-	,			Labor Prod	uctivity =				1			Reviewer:	
														1				
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
	DUCTWORK MODIFICATIONS																	
	MODIEV CAS DUGT TO ACCEPT IN IEOTION																	
	MODIFY GAS DUCT TO ACCEPT INJECTION NOZZLES		Ī														Ī	
	DUCTWORK MODS		Est	<del>  1</del>	TN	2,625.00	2,625		05.00	J		FI 50:			ļ			
	INSULATION & LAGGING	6" THICK INSULATION	Est	200	SF	2,025.00			35.00 0.27			FLDU DINS	89.66 59.32			<b></b>	ļ	5,80
					<u> </u>	21.00	7,200		0.27	34	54	פאוט	39.32	3,203			<b> </b>	7,40
DW-4	DUCTWORK SUPPORT STRUCTURES																	
	STRUCTURAL STEEL		Est	5	TN	1,890.00	9,450		16.00			STST	86.46	6,917				16,40
	ACCESS & GALLERIES		Est	400	SF	31.50	12,600		0.40	160	160	GALL	71.2	11,392				24,00
									<b>_</b>	<u> </u>								
DW-6	BOILER MODS								1								-	
	WALL AND TUBE MODS		Est	2	TN	2,625.00	5,250		35.00	70	70	FLDU	89.66	6,276		<u> </u>		11,50
									1	1	, ,	1200	00.00	0,270				11,50
DW-7	DUCTWORK SUBTOTAL																	
- · · ·	DOCT WORK SUBTOTAL						34,125				399			30,926				65,10
	Injection System																ļ	
IS-1	EQUIPMENT/COMPONENTS								ļ								<b> </b>	
	Air Blowers	Not required	Est	3	EA	21,000.00	63,000		40.00	120	120	MECH	66.86	8,023				71,00
	VFD Rotary Feeder	Not required	Est	1	EA	10,500.00	10,500		30.00	30		MECH	66.86	2,006			<u> </u>	12,50
	Long-Term Storage Silo - Common for 2 Units (10																	12,00
		SS Hopper Not required	Est Est	0	EA EA	139,000.00	139,000		580.00	580	580	TANK	65.78	38,152				177,20
		50 hp - 2 X 100%	Est	2	EA	0.00 21,000.00	42,000		60.00 80.00	160	160	TANK MECH	65.78 66.86	10.600			L	50.70
		808,320 lb full - 8,520 ft3 -		<u> </u>		21,000.00	42,000		00.00	100	100	MECH	00.00	10,698				52,70
. [		D=20.8' - H=25.0' - CS Silo -												·				
		SS Hopper	Est	1	EA	61,000.00			880.00	880 30	880	TANK	65.78					118,90
	Mixing Tank Agitator (1 Qty)	20 hp - CS Shaft	Est	1	EA	21,000.00	21,000		30.00	30	30	MECH	66.86					23,00
1	Water Storage Tank - 1 Unit (24 Hrs)	125,000 lb full - 2,000 ft3 - D=13.7' - H=13.7' - CS	Ect			EE 500.00	55 500		200 00	222		<b>T</b> ,						
	Slurry/Water Pumps (6 Qty)	2 hp - CS	Est Est	6	EA EA	55,500.00 5,250.00	55,500 31,500	:	880.00 20.00	880		TANK	65.78				<u>                                     </u>	113,40
	Injection Manifold (2 Qty)	Stainless Steel	Est	2	EA EA	10,500.00	21,000	The state of the s	20.00	120 480		PUMP MECH	65.83 66.86	7,900 32,093			<b></b>	39,40
	Dual Fluid Injection Nozzles (20 Qty)	Stainless Steel	Est	1	LT	42,000.00	42,000		96.00	96	96	MECH	66.86	6,419			<del>                                     </del>	53,10 48,40
	System Piping												30.00	0,410				70,70
	1" - CS	Includes fitting allowance	Est	300	LF	2.27	680		0.16	49	49	SPNG	70.4	3,464				4,100
		Includes fitting allowance	Est	50	LF	9.28	464		0.33	17		SPNG	70.4	1,162				1,600
	Piping Insulation & Lagging		Est	350	LF	2.99	1,047		0.08	26	26	INSUL	53.39	1,402				2,40
	Heat Tracing		Est	350	LF	21.00	7,350		0.31	109	109	WIRE	69.06	7,493				14,80
		Allowance	Est	1	LS	1,050.00	1,050		24.75	25	25	SPNG	70.4	1,742				2,80
	Supply Piping Water Supply	Allania																
		Allowance	Est	200	LS	840.00	168,000		100.00	20,000	20,000		70.4	1,408,000				1,576,00
- +		Allowance	Est	200	LS	525.00	105,000		80.00	16,000		SPNG	70.4	1,126,400				1,231,40
		Allowance Allowance	Est Est	10	LS TN	2,100.00 2,200.00	2,100 22,000		40.00 16.00	40	40	SPNG	70.4	2,816				4,900
		INCLUDES EXCAVATION &	<u> </u>	10	1111	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
S-2		BACKFILL	Est	110	CY	157.50	17,325		7.00	770	770	CONP	52.91	40,741			, · · · · · · · · · · · · · · · · · · ·	58,100

r						Louis	ville Gas & E	lectric								E	stimate No.:	22013B
							Ghent Unit 4										Project No.:	10584-022
Sargent 8	Lundy <sup>LLC</sup>						Mitigation Sy		<del> </del>								Date:	: 12/20/2005
ca							Magnesium										Rev Date	1/27/2006
							agnitude Co						1			***************************************	Run Date	: 1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote								Waga Batas	Paged on			Louisville	KV			Preparer	
						-0	ONFIDENTIA	L- ·	Wage Rates			-	Louisvine				Reviewer	
									Labor Produ	ictivity =			1				neviewei	
-																		
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u> t
			Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
IS-3	STRUCTURAL STEEL		Lot	10														
10.4	AUGER CAST PILES (120 TON CAPACITY)	90 ft LONG	Est	0	LF	10.00	0		0.52	0	0	PILE	82.81	0				
IS-4	AUGENTANT TEED (120 TOR OAL AUTT)						000 547		<b>_</b>		40,731			2,843,955				3,677,300
IS-5	IS SYSTEM SUBTOTAL				<u> </u>		833,517			-	40,731		<u> </u>	2,043,933				3,077,300
									1									***************************************
				<u> </u>						1								
	MATERIAL UNLOADING SYSTEM																	
AC11.1	TOLICK LINI CADING SYSTEM		Est	1	Set	105,000.00	105,000		1254.00	1,254	1,254	SPNG	70.4	88,282				193,300
ASH-1	TRUCK UNLOADING SYSTEM										1 054			00.000		·		102 200
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL						105,000			<u> </u>	1,254			88,282				193,300
	AUXILIARY POWER SUPPLY																·	
	SYSTEM/I&C	and the second s							-								:	
										<u> </u>								
	POWER SOURCE	Double Ended Unit																
		Substation with (2) 1 MVA,							ŀ									
	OWITCH OF AD	6.9-480V XFMR's	Est	1	EA	460,000.00			500.00			EHEA	53.92	26,960		***************************************		487,000
	SWITCHGEAR New Breaker at Existing 13.2kV Switchgear	0.5 400 777 777 77	Est	1	EA	63,000.00			100.00	100	100 400	EHEA EHEA	53.92	21,568				63,000 105,600
	MCC		Est	2	EA	42,000.00			200.00 300.00	300		EHEA	53.92	21,566 16,176	<u> </u>			24,600
	Misc Electrical Equipment & Controls		Est	11	LS	8,400.00	8,400		300.00	300	0	LIILA	30.32	10,170				24,000
				<del> </del>						1	. 0							
AP-2	GROUNDING		Est	2,000	T LF	2.10	4,200		0.05		100		69.06	6,906				11,100
	Cable - 500kcmil GND		Est	12	EA	199.50			4.00	48	48	PILE	82.81	3,975	-			6,400
	Grounding Rod																	
AP-3	CABLE								I		_	WIRE	69.06					
AF-3	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF_	33.60		Routed in 5" Conduit Routed in 3" Conduit	0.69 0.69		173	WIRE	69.06	U			***************************************	1
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.70		Routed in 2" Conduit	0.08	1/3	173	WIRE						
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	0.40	1 — ⊸	Routed in 1-1/2"	1	l								
		3/C #2/0, 600V	Est	0	LF	6.30		Conduit	0.52	0	0	WIRE	69.06					0
	Power Cables from Switchgear to TR Sets Power Cables from MCC to Loads - 1 ~ 5HP	3/C #2/0, 600V	Est	300	LF	0.70	5 227	Routed in 3/4" Conduit			16	WIRE	69.06					1,300
	Power Cables from MCC to Loads - 1 ~ 5HP  Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	150	LF	1.58	236	Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549				800
<b> </b>	1 OHO! ORDICO HOLL MICO TO LOCADO TOTA				1		ہ ا	Routed in 1-1/2" Conduit	0.09	_	_	WIRE						1
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	0	LF	2.12		Routed in 1-1/2"	0.08	1								
		0/0 //4 0001/	Est	100	LF	2.6	267	Conduit	0.35	35	35	WIRE		·				<b></b>
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V 3/C #2, 600V	Est	50	LF	3.58	179	Routed in 2" Conduit	0.35	18	18	WIRE	69.06	1,209				1,400
	Power Cables from MCC to Loads - 60HP	5/C #2, 600V	Est	300	LF	0.6		Routed in 3/4" Conduit	0.03	10	10	WIRE	69.06	663				900
	Control Cables - Pumps	0,0 11 13 0001						Routed in 1-1/2"	1	_	_	WIRE	69.06					
	Control Cables - TR Sets	7/C #14, 600V	Est	0	<u>LF</u>	0.8		Conduit Routed in 3/4" Conduit	0.04	24	24	WIRE	69.06	1,657				1,800
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF LF	0.29 3.19		Routed in 3/4" Conduit			32	WIRE	55.50	1,007				1,500
	Data Highway Cable		Est	1,000	+	3.13	3,130		1									
	RACEWAY		Est	2,500	LF	2.0			0.19		485	ECND						
	3/4" Conduit 1-1/2" Conduit		Est	100	LF	4.6			0.28	28 18	28	ECND ECND						
f	2" Conduit		Est	50	LF	6.2			0.35 0.65		181	ECND						
	3" Conduit		Est	250	LF_	13.1 38.3			1.13		101	ECND						
	5" Conduit		Est	0	LF	30.3	<u> </u>	J.	1.10									Jednord Committee Committe

						Louis	ville Gas & E	lectric		. [					<u> </u>		Estimate No.	: 22013B
	& Lundy <sup>LLC</sup>						Ghent Unit 4								<b>†</b>		Project No.	: 10584-022
Chica	ago			-			Mitigation S										Date	: 12/20/2005
-	Cost Type: Est = Estimated, Bid = Vendor quote			-			<ul> <li>Magnesium</li> <li>lagnitude Co</li> </ul>		-						-		Rev Date	<del></del>
-	- Typo, Lot - Lottinated, Bid - Veridor quote								Wage Rates	Based on:			Louisville	. KY	<u> </u>		Preparer	: 1/27/2006
									Labor Produ				-				Reviewer	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
AP-5	DCS SYSTEM ADDITIONS																	
711 0	Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	4(	EHEA			<b>1</b>			
AP-8	DCS PROGRAMMING/INTERFACE										(							
	Interface Hardware		Est	1	EA	2,625.00			20.00		20	EHEC						
	Programming /Interface		Est	1 1	LT	5,250.00	5,250		0.00		(	WIRE	69.06	C				5,30
AP-9	LIGHTING ALLOWANCE		Est	1	LT	10,500.00	10,500		100.00	100	100	INEL						
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						689,199				2,615	5		80,761				709,20
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE																
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	5,250.00	5,250		1550.00	1,550	1,550	PNTR	55.58	86,149	)			91,40
MISC-2	ROADWORK	Not Required	Est	0	LS	36,750.00	0		380.00	0	C	PBIT	62.43	0				
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,90
MISC-4	OTHER																	
	PUMP HOUSE 15' X 20'																	
	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,20
	PREFAB BLDG.		Est	1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,20
MISC-5	CFD MODEL STUDY		Est	1	LS	100,000.00	100,000		40.00	40		STST	86.46					103,500
MISC-6	TANK BERM		Est	1	LS	76,000.00	76,000		260.00	260		STST	86.46					98,500
	SOFT WATER SUPPLY SYSTEM		Est	1	LS	35,000.00	35,000		60.00			STST	86.46			***************************************		40,200
	MISC. SUBTOTAL						54,538				2,155		55.10	122,239				176,700
							- 1,000				2,100							170,700
	GENERAL SUPPORT																	
	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
	GENERAL SUPPORT SUBTOTAL						0				. 0			100,000				100,000
	SUBTOTAL					:	1,927,379				47,514			3,297,288				
	VIA		· .				1,321,319		X	U	47,514			3,231,268	1		ý.	5,163,800 (

						Louis	ville Gas & E	lectric									Estimate No.	22013B
0	& Lundy <sup>LLC</sup>		***************************************				<b>Ghent Unit 4</b>										Project No.	10584-022
						SO3	Mitigation Sy	/stem									Date	12/20/2005
ica	Igo						Magnesium										Rev Date	1/27/2006
					-		agnitude Co										Run Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote								Wage Rates	Pecad on			Louisville	KV			Preparer	
				ļ		-0	ONFIDENTIA	<u> </u>					LUUISVIIIC	, K1			Reviewer	
									Labor Produ	ctivity =			•				neviewei	•
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
											1 425	MECH	66.86	95,303				95,30
1	Craft Support During Startup	At 3% of Total Manhours		-							1,425	IVIEUT	00.00	30,000			1	Not Included
	Allowance for Premium Time Labor															-		Not Included
	Productivity Loss Due To Overtime																	Not Included
	Per Diem Expense																	Not Included
	Project Wrap (Efficacy) Insurance Erection Contractor's General & Administrative																1	Troc moradou
	Erection Contractor's General & Administrative	At 5% of Material and Labor					1										1 .	258,20
	Costs	Costs																200,20
	Erection Contractor's Profit	At 8% of Material and Labor															1	413,10
	Election Contractors Front	Costs					<u> </u>											Included
																		w\Equipment
																	I	Costs
9	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs			_		ļ											Included
			1		Ĭ	1												w\Equipment
																		Costs
	Special Tools	Included w\Equipment Costs																10000
		At 0.5% of	İ							l							1	9,60
	Consumables	Equipment/Material Cost			-													
*		At 4.5% of			1							l					1	86,70
	Freight To Site	Equipment/Material Cost		_														Not Included
	Taxes - Sales/Use/VAT/Business/Etc.			_														
	Construction Utilities (Elect, Water, etc.) During			1	İ	4.5						l						By Owner
	Construction	Furnished by Owner			-												1	
					_					C	48,939			3,392,592	,			6,026,70
1.5	SUBTOTAL INSTALLED COST				1													
	L CONTROL MANAGEMENT	Furnished by Project Team		<del></del>						C								602,70
ENGINE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team								C								
PERMIT	TING, MODELING, ETC.				1					C		,						50,00
	IP, TESTING AND REAGENT (15 DAYS)	At 20% of Total	<b> </b>	_						C								1,335,90
CONTING	GENUT	To Be Furnished by Owner	<b>-</b>	1						0								100,00
CLIENT	INTERNAL COST	TO DE l'ultilistieu by Owilei	<del> </del>	1	1					0								Not Included
SPARE F		Not Included	1		1													
ESCALA	TION ST DURING CONSTRUCTION (AFUDC)	Not included	1															
INTERES	SEDUMING CONSTRUCTION (APODC)	Not included																
<u></u>	PROJECT TOTAL :		<b></b>							C								8,115,30

						Louis	ville Gas & E	lectric								E	stimate No.:	22014B
							Ghent Unit 4										Project No.:	10584-022
	Lundy <sup>LLC</sup>						Mitigation Sy									,	Date:	12/20/2005
ca	go						ion 3 - Soda									/	Rev Date	1/27/2006
							agnitude Co										Run Date:	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer:	
,									Labor Produ	ctivity =			1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cost
	DUCTWORK MODIFICATIONS																	
					<b> </b>													
1	MODIFY GAS DUCT TO ACCEPT INJECTION NOZZLES											<u></u>		0.465				
DW-1	DUCTWORK MODS		Est	1	TN	2,625.00	2,625		35.00	35 54	35	FLDU DINS	89.66 59.32	3,138 3,203				5,800 4,900
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40	1,680		0.27	54	54	DINO	39.32	3,203				7,500
				<u> </u>														
DW-4	DUCTWORK SUPPORT STRUCTURES STRUCTURAL STEEL		Est	5	TN	1,890.00	9,450		16.00	80	80	STST GALL	86.46					16,400 24,000
	ACCESS & GALLERIES		Est	400	SF	31.50	12,600		0.40	160	160	GALL	71.2	11,392				24,000
				ļ														
							26,355				329			24,650				51,100
DW-9	DUCTWORK SUBTOTAL															-		
	Injection System																	
ļ	EOLUDAENT/OOMPONENTS																	1 001 000
L	EQUIPMENT/COMPONENTS Process Technology Package (PTP) by URS		Est	1	EA	1,800,000.00	1,800,000		20.00	20	20	PUMP	65.83	1,317				1,801,300
	Pumps (6 Qtv)	4 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP	Est	6	EA	2,100.00	12,600		20.00	120	120	PUMP	65.83	7,900				20,500
		420,250 lb full - 5,180 ft <sup>3</sup> - D=17.6' - H=21.2' - SS	Est	1	EA	363,000.00	363,000		535.21	535		TANK	65.78					398,200
	Coff II o Olympa Tark, 4 Heit, (24 Hours)	309,312 lb full - 4,957 ft <sup>3</sup> - D=18.48' - H=18.48' - CS	Est	1	EA	83,000.00			489.52	490		TANK	65.78					115,200 23,000
	Soft H <sub>2</sub> O Storage Tank - 1 Unit - (24 Hours) Agitator (1 Qty)	SS Shaft - 20 HP	Est	1	EA	21,000.00			30.00 80.00	30 160		MECH MECH	66.86 66.86					52,700
	Air Compressors (2 Qty)	2 x 100% - 50 HP	Est	2	EA EA	21,000.00 10,500.00	42,000 21,000		240.00		480	MECH	66.86					53,100
	Injection Manifold (2 Qty)	Stainless Steel	Est Est	2	LT	21,000.00			480.00	480	480	MECH MECH	66.86	32,093				53,100
	Dual Fluid Injection Nozzles (100 Qty)	Stainless Steel  L=250' - D=4" - SS / L=50' - D=4" - CS / L=50' - D=2" - SS	LSt			250								7.000				15 000
	System Piping 6" - SS	Includes fitting allowance	Est	250	LF	30.61			0.42 0.42	105 21		SPNG SPNG	70.4 70.4					15,000 2,100
	6" - CS	Includes fitting allowance	Est	50	LF LF	11.89				17		SPNG	70.4					2,100
	4" - SS	Includes fitting allowance	Est	50	LF	24.89			0.33 0.17	60		INSUL	53.39					6,400
	Piping Insulation & Lagging		Est Est	350 350	LF LF	9.1 <sup>2</sup> 21.00			0.17	109	109	WIRE	69.06					14,800
	Heat Tracing	Allowongo	Est	1	LS	2,520.00			48.00			SPNG	70.4					5,900
	Valves	Allowance	ESI	<del>                                     </del>		2,020.00												
	Supply Piping Water Supply	Allowance	Est	1	LS	840.00			100.00	100		SPNG	70.4					7,900
	Air Supply	Allowance	Est	1	LS	525.00			80.00	80 112		SPNG SPNG	70.4 70.4				*	6,200 10,800
	Piping Supports	Allowance	Est	1	LS	2,940.00			112.00 16.00	112 160	112	STST	86.46					35,800
	Piping Rack	Allowance	Est	10	TN	2,200.00	22,000		1 10.00									*
IS-2	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	75	CY	157.50			7.00			CONP	52.91					39,600
1 -	STRUCTURAL STEEL		Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
IS-3	AUGER CAST PILES (125 TON CAPACITY)	100 ft LONG	Est	0	LF	10.00	0		0.52	0	0	PILE	82.81	0				0
			) Est	0	LF						<u> </u>			0				0
IS-3	ROYALTY FEE		Lot			*								L .				

			T			Louis	ville Gas & E	lectric							<u> </u>		stimate No.:	22014B
Sargent 8	ዩ Lundy <sup>LLC</sup>						Ghent Unit 4										Project No.:	10584-022
Chica					<u> </u>	SO3	Mitigation Sy			1		ļ	1				<del>                                     </del>	12/20/2005
'ilca	go			<del> </del>			tion 3 - Soda				<del> </del>	<u> </u>	-	<u> </u>	<u> </u>		Rev Date	1/27/2006
					1					+	<u> </u>		ļ	ļ				
	Cost Type: Est = Estimated, Bid = Vendor quote				-		lagnitude Co										Run Date:	1/27/2006
						-C	ONFIDENTIA	AL-	Wage Rates	Based on:			Louisville	, KY			Preparer:	
									Labor Produ	uctivity =	*		1				Reviewer:	
Item No.	Description	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>S</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
IS-4	IS SYSTEM SUBTOTAL						2,446,275				3,810			253,595		1		2,699,80
	MATERIAL UNLOADING SYSTEM																	
ASH-1	TRUCK UNLOADING SYSTEM		Est	1	Set	105,000.00	105,000		1254.00	1,254	1,254	SPNG	70.4	88,282				193,30
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL						105,000				1,254			88,282				193,30
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE	Double Ended Unit Substation with (2) 1MVA,																
	SWITCHGEAR	6.9-480V XFMR's	Est	1	EA	460,000.00	460,000		500.00		500	EHEA	53.92	26,960			: :	487,00
	New Breaker at Existing 13.2kV Switchgear		Est	1	EA	63,000.00	63,000		100.00	100		EHEA	53.92	5,392				68,40
	MCC		Est	2	EA	42,000.00			200.00	400	400		53.92	21,568				105,60
	Misc Electrical Equipment & Controls		Est	1	LS	8,400.00	8,400	· ·	300.00	300	300	EHEA	53.92	16,176				24,60
AP-2	GROUNDING																	
	Cable - 500kcmil GND		Est	2,000	LF	2.10			0.05	100	100	WIRE	69.06					11,10
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,40
													ļ					***************************************
	CABLE				ļ			0 1 1 2 5 5 0 1 2				14/15/5	00.00					
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF_	33.60		Routed in 5" Conduit	0.69		170	WIRE	69.06					15.00
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	l LF	14.70		Routed in 3" Conduit Routed in 2" Conduit	0.69		173	WIRE WIRE	69.06	11,913				15,60
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.40		Routed in 1-1/2"	0.35		U	VVIDE	69.06	U				
	Daniel Oak las franc Ouitak asan ta TD Cata	3/C #2/0, 600V	Est	0	LF	6.30	1	Conduit	0.52	0	0	WIRE	69.06	0				-
	Power Cables from Switchgear to TR Sets Power Cables from MCC to Loads - 1 ~ 5HP	3/C #2/0, 600V	Est	200	LF	0.76		Routed in 3/4" Conduit	0.05	11	11	WIRE	69.06	732				90
	Power Cables from MCC to Loads - 1 ~ 5HP  Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	T LF	1.58		Routed in 3/4" Conduit	0.05		o	WIRE	69.06	0				
	- Once Gables from Weet to Leads - 10th	,,	T	1				Routed in 1-1/2"										
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	900	LF	2.12		Conduit Routed in 1-1/2"	0.09	81	81	WIRE	69.06	5,594				7,50
	Danier Oaklas from MOO to Lande COUR	2/0 #4 600\/	Est	250	LF	2.67		Conduit	0.35	ρρ	ρΩ	WIRE	69.06	6,043				6,70
	Power Cables from MCC to Loads - 50HP Power Cables from MCC to Loads - 60HP	3/C #4, 600V 3/C #2, 600V	Est	0	I LF	3.58		Routed in 2" Conduit	0.35	0	00	WIRE	69.06					0,70
	Control Cables - Pumps	5/C #14, 600V	Est	900	LF	0.67		Routed in 3/4" Conduit	0.03	29	29	WIRE	69.06	1,989				2,60
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81		Routed in 1-1/2" Conduit	0.04	n		WIRE	69.06					
	Instrumentation Cables	2 PR #16 SHLD	Est	750	T LF	0.25		Routed in 3/4" Conduit	0.03	24	24	WIRE	69.06					1,80
	Data Highway Cable		Est	1,000	LF	3.15		Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210				5,40
	RACEWAY				ļ.,	2.5						ECNID	40.07	07.400				00.55
	3/4" Conduit		Est	2,850	LF LF	2.06 4.67			0.19 0.28	553 327	553	ECND ECND	49.67 49.67	27,463 16,222				33,30
	1-1/2" Conduit		Est	1,150	LF LF	6.25			0.28	32/	321 0	ECND	49.67	10,222				21,60
	2" Conduit		Est Est	0 250	LF LF	13.13	3,281		0.35	161	161	ECND	49.67	8,009				11,30
	3" Conduit 5" Conduit		Est	0	LF	38.33			1.13	0		ECND	49.67	0,009				11,30
Ar-5	DCS SYSTEM ADDITIONS														:			
	Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157	•			33,70
AP-8	DCS PROGRAMMING/INTERFACE																	

<u> </u>						Louis	ville Gas & E	lectric			-						Estimate No.:	: 22014B
Sargent 8	Lundy <sup>LLC</sup>						Ghent Unit 4										Project No.:	: 10584-022
hica							Mitigation Sy										Date	: 12/20/2005
<u> </u>							ion 3 - Soda										Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate									Run Date:	: 1/27/2006
						-C	ONFIDENTIA	AL-	Wage Rates				Louisville	, KY			Preparer:	:
									Labor Produ	ctivity =			1				Reviewer:	:
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cost</u>
	Interfered Headings		Est	1	EA	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187				3,800
	Interface Hardware Programming /Interface		Est	<del>                                     </del>	LT	5,250.00			0.00	0	0	WIRE	69.06					5,300
	r rogramming /interlace																	
AP-9	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,800
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						701,985				3,135			175,156				877,400
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE																
													ļ					
	<u>MISCELLANEOUS</u>	NONE										)						
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,675.00	3,675		1250.00	1,250	1,250	PNTR	55.58	69,475				73,200
2	ROADWORK		Est	0	LS	36,750.00	0		380.00	0	0	PBIT	62.43	0				0
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4	OTHER																	
	PUMP HOUSE 15' X 20'																	
IS-2	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,200
	PREFAB BLDG.		Est	1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,200
MISC-5	CFD MODEL STUDY		Est	1	LS	30,000.00	30,000		40.00	40	40	STST	86.46	3,458				33,500
MISC-6	TANK BERM		Est	1	LS	61,000.00	61,000		260.00	260	260	STST	86.46	22,480				83,500
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	22,000.00	22,000		60.00	60	60	STST	86.46	5,188				27,200
MISC-5	MISC. SUBTOTAL						165,963				2,215			136,691				302,700
								<u> </u>										
	GENERAL SUPPORT															· · · · · · · · · · · · · · · · · · ·		
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,000
	SUBTOTAL			# **			3,445,578			0	10,743			778,373				<b>4,224,300</b>
	Craft Support During Startup	At 3% of Total Manhours									322	MECH	66.86	21,549				21,500
	Allowance for Premium Time Labor				<u> </u>		<u> </u>							:				Not Included Not Included
	Productivity Loss Due To Overtime																	Not included Not included
	Per Diem Expense Project Wrap (Efficacy) Insurance				v													Not Included

						Louis	ville Gas & E	lectric								E	stimate No.:	22014B
Sargent	& Lundy <sup>LLC</sup>						<b>Ghent Unit 4</b>										Project No.:	10584-022
Chica						SO3	Mitigation Sy	vstem									Date:	: 12/20/2005
			<del>                                     </del>				ion 3 - Soda					1			<del> </del>	1	<del> </del>	1/27/2006
<b>-</b>	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co					1		l	<del> </del>			: 1/27/2006
	Oost Type. Lat - Latiniated, Did - Vendor quote			-					B-1	D							<u> </u>	<b>_</b>
			ļ		<u> </u>		ONFIDENTIA	AL-	Wage Rates				Louisville	, KY			Preparer:	
	-								Labor Produ	ctivity =			1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
										÷								
	Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs	,							\$ .	) Pr 							211,20
	Erection Contractor's Profit	At 8% of Material and Labor Costs																337,90
								A										Included
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs	-	, i							·							w\Equipment Costs
	l l l l l l l l l l l l l l l l l l l												,					Included
																		w\Equipment
	Special Tools	Included w\Equipment Costs					i i											Costs
	Consumables	At 0.5% of Equipment/Material Cost														44		17,20
		At 4.5% of																
	Freight To Site	Equipment/Material Cost																155,10
	Taxes - Sales/Use/VAT/Business/Etc.				ļ													Not Included
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
	SUBTOTAL INSTALLED COST										11,066			799,922				4 007 000
	SOBTOTAL INSTALLED COST		<b></b>						li		11,000			199,922				4,967,200
FNGINF	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team								0							***	496,700
PERMITT	ING, MODELING, ETC.									0			-					100,70
STARTU	P, TESTING AND REAGENT (15 DAYS)			:						0	-							50,000
CONTING	GENCY	At 20% of Total								0								1,102,80
	NTERNAL COST	Furnished by Owner								0								100,000
SPARE F										0								Not Included
ESCALA <sup>*</sup>		Not Included			<b></b>					: · · .					-			
INTERES	T DURING CONSTRUCTION (AFUDC)	Not Included			ļ		-											
	PROJECT TOTAL :				<b> </b>													6,716,700
	IFROJECT TOTAL:		I	İ					1	Y			1		l l			0,/16

						Louis	ville Gas & E	lectric		-				T		Τ	stimate No.	· 22015B
Sargent	& Lundy <sup>LLC</sup>	and the state of the contract					Ghent Unit 4					1					Project No.	
Chica	igo					SO3	Mitigation S					1						: 12/20/2005
							Sodium Bisi						<del> </del>				Rev Date	<del> </del>
	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co					-			<u> </u>			: 1/27/2006
							CONFIDENTIA		Wage Rates	Based on:			Louisville	e. KY			Preparer	<del></del>
									Labor Produ			1		1	1		Reviewer	
										-								
<u>Item No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	Total Projected Co
	DUCTWORK MODIFICATIONS																	
												<b> </b>	<b>-</b>					
	MODIFY GAS DUCT TO ACCEPT INJECTION NOZZLES			<u> </u>														
- Y Y -	DUCTWORK MODS		Est	1 1	TN	2,625.00	2,625		25.00	J		EL EL			<b></b>			
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	2,625.00			35.00 0.27	35 54		FLDU	89.66 59.32					5,80 4,90
						3.40	1,550		0.27			D.143	J9.32	5,203	<b> </b>			4,90
DW-4	DUCTWORK SUPPORT STRUCTURES																	
	STRUCTURAL STEEL ACCESS & GALLERIES	/	Est Est	5 400	TN SF	1,890.00	9,450		16.00	80			86.46					16,40
	AOOLOS & GALLENIES		ESI	400	SF.	31.50	12,600		0.40	160	160	GALL	71.2	11,392				24,00
													<b>!</b>					
DW-9	DUCTWORK SUBTOTAL						26,355				329			24,650				51,10
													ļ					
***************************************	Injection System																	
,	EQUIPMENT/COMPONENTS																	
į,	Process Technology Package (PTP). The cost	P&ID, Control Logic, Injection											ļ			,		
		and metering pump skids, Proprietory injection lances 4 - CS internals - 2.0 HP / 4 -	Budget	1	EA	1,200,000.00	1,200,000		200.00	200	200	MISC	65.83	13,166				1,213,20
71	Pumps (0 Qty)	SS internals - 2.0 HP / 4 - SS internals - 1.0 HP, included in PTP	Est	0	EA	0.00	0		20.00	0	0	PUMP	65.83	0				
		825,400 lb full - 12,100 ft <sup>3</sup> -										***************************************		****				
	SBS Solution Tank - 1 Unit (10 Days)	D=23.4' - H=28.0' - SS 309,312 lb full - 4,957 ft <sup>3</sup> -	Est	1	EA	221,000.00	221,000		1064.00	1,064	1,064	TANK	65.78	69,990				291,00
	Soft H₂O Storage Tank - 1 Unit - (24 Hours)	D=18.48' - H=18.48' - CS	Est	1	EA	83,000.00	83,000		1514.14	1,514	1 51/	TANK	65.78	99,600				182,600
	Agitator (1 Qty)	SS Shaft - 20 HP	Est	1	EA	10,000.00	10,000		30.00	30	30	MECH	66.86	2,006				12,000
	Air Compressors (2 operating, 1 standby for each	0 4000/ 450.115	-															
	Unit)	3 x 100% - 150 HP Stainless Steel included in	Est	3	EA	225,000.00	675,000		120.00	360	360	MECH	66.86	24,070				699,10
· · · · · · · · · · · · · · · · · · ·	Injection Manifold (2 Qty)	PTP	Est	2	EA	0.00	0		0.00	0	0	MECH	66.86	0				
l		L=500' - D=6" - SS / L=400' - D=6" - CS / L=300' - D=4" -																
	System Piping	SS - CS / L=300 - D=4 -																
	6" - SS	Includes fitting allowance	Est	500	LF	30.61	15,304		0.42	210	210	SPNG	70.4	14,784				30,100
		Includes fitting allowance	Est	300	LF	11.89			0.42	126		SPNG	70.4					12,400
	4" - SS	Includes fitting allowance	Est	300	LF	24.89			0.33	99		SPNG	70.4					14,400
	Piping Insulation & Lagging		Est	500	LF	9.14	4,568		0.17	85	85	INSUL	53.39					9,100
	Heat Tracing		Est	500	LF	21.00	10,500		0.31	155	155	WIRE	69.06	10,704				21,200
		Allowance	Est	1	LS	2,520.00	2,520		48.00	48	48	SPNG	70.4	3,379				5,900
	Supply Piping Water Supply piping	Allowance		4		040.00	0.46		100.00			05115						
	Air Supply piping	Allowance Allowance	Est		LS	840.00	840		100.00	100		SPNG	70.4	7,040				7,900
	Piping Supports	Allowance	Est Est	1	LS LS	525.00 2,940.00	525 2,940		80.00 112.00	80		SPNG	70.4	5,632				6,200
	Piping Rack	Allowance	Est	10	TN	2,940.00	2,940		112.00	112 160		SPNG STST	70.4 86.46	7,885 13,834				10,800 35,800
	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	90														
	2.21	DAOIN ILL	⊏3l	90	CY	157.50	14,175		7.00	630	630	CONP	52.91	33,333				47,500
S-3	STRUCTURAL STEEL	Allowance	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
													, "		1.0			e .

						Louis	ville Gas & E	lectric		1							Estimate No.	: 22015B
Sargent	& Lundy <sup>LLC</sup>		·				Ghent Unit 4			<del> </del>							7	: 10584-022
Chica			:			SO3	Mitigation Sy		<del> </del>								<del> </del>	: 12/20/2005
							Sodium Bisu					1					Rev Date	<del> </del>
1	Cost Type: Est = Estimated, Bid = Vendor quote	and the first that the second control of the					lagnitude Co			<b>†</b>		T			<del>                                     </del>	<del>                                     </del>		: 1/27/2006
							ONFIDENTIA		Wage Rates	Based on:		-	Louisville	. KY	1		Preparer	
									Labor Produ				1	1			Reviewer	
																	1101101101	•
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Co</u>
IS-3	AUGER CAST PILES (125 TON CAPACITY)	100 ft LONG	Est	2,200	LF	10.00	22,000		0.52	1,144	1,144	PILE	82.81	94,735		·		116,70
		Not Included, \$ per MW, to be								***************************************								
IS-4	ROYALTY FEE	negotiated with Vendor	Est	0	LF									_				
																		:
IS-5	IS SYSTEM SUBTOTAL										6,077			421,203				2,751,70
	MATERIAL UNLOADING SYSTEM																	
ASH-1	TRUCK UNLOADING SYSTEM		Est	1	Set	105,000.00	105,000		1254.00	1,254	1.254	SPNG	70.4	88.282				193,30
J	MATERIAL LINE CARRIES OVOTERS OF THE									-,			, , , , ,					
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL						105,000				1,254			88,282				193,30
	AUXILIARY POWER SUPPLY SYSTEM/I&C									,								
AP-1	POWER SOURCE							·										
	SWITCHGEAR	Double Ended Unit Substation with (2) 1 MVA, 6.9-480V XFMR's	Est	1	EA	488,750.00	488,750	-	500.00	500	500	FUEA	50.00	00.000				
	New Breaker at Existing 13.2kV Switchgear	0.9-400V XI WII 13	Est	1	EA	63,000.00	63,000		500.00 100.00	500 100	100	EHEA EHEA	53.92 53.92	26,960 5,392				515,70 68,40
	MCC		Est	2	EA	42,000.00	84,000		200.00	400	400		53.92	21,568				105,60
	Misc Electrical Equipment & Controls		Est	1	LS	8,400.00	8,400		300.00	300	300	EHEA	53.92	16,176				24,60
AP-2	GROUNDING																	
	Cable - 500kcmil GND		Est	2,000	LF	2.10	4,200		0.05	100	100	WIRE	69.06	6,906				11,10
	Grounding Rod		Est	12	EA	199.50			4.00	48		PILE	82.81	3,975				6,40
AP-3	CABLE									***************************************			4.7					
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	100	LF	33.60	3 360	Routed in 5" Conduit	0.69	69	60	WIRE	69.06	4,765				0.40
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.70	3,675	Routed in 3" Conduit	0.69	173	173	WIRE	69.06	11,913				8,10 15,60
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.40	0	Routed in 2" Conduit Routed in 1-1/2"	0.35	0	0	WIRE	69.06	0				10,00
:	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30	0	Conduit	0.52 0.05	0	0	WIRE	69.06	o	1			
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	200	LF	0.76		Routed in 3/4" Conduit	0.05	11	11	WIRE	69.06	732				90
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	LF	1.58		Routed in 3/4" Conduit Routed in 1-1/2"	0.05	0	0	WIRE	69.06	0				
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	50	LF	2.12	106	Conduit Routed in 1-1/2"	0.09	5	5	WIRE	69.06	311			**************************************	400
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V	Est	100	LF	2.67	267	Conduit	0.35	35 88	35	WIRE	69.06	2,417				2,70
	Power Cables from MCC to Loads - 150HP Control Cables - Pumps	3/C #2, 600V	Est	250	LF LF	3.58		Routed in 2" Conduit	0.35	88	88	WIRE	69.06	6,043				6,900
	Control Cables - Fullips	5/C #14, 600V	Est	175	LF	0.67		Routed in 3/4" Conduit Routed in 1-1/2"	0.03	- 6	6	WIRE	69.06	387				500
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81		Conduit	0.04	o	0	WIRE	69.06	ما				
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25	189	Routed in 3/4" Conduit	0.03	24	24	WIRE	69.06	1,657				1,800
	Data Highway Cable		Est	1,000	LF	3.15	3,150	Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210				5,400
AP-4	RACEWAY					-												
	3/4" Conduit	1	Est	2,125	LF	2.06	4,373		0.19	412	412	ECND	49.67	20,477				24,800
	1-1/2" Conduit		Est	150	LF	4.67	701		0.28	43	43	ECND	49.67	2,116				2,800
	2" Conduit 3" Conduit	<u> </u>	Est Est	250 250	LF LF	6.25 13.13	1,562 3,281		0.35	88		ECND	49.67	4,371				5,900
	5" Conduit		Est	100	LF LF	38.33	3,281		0.65 1.13	161 113	161	ECND ECND	49.67 49.67	8,009 5,598				11,300 9,400

						Louis	ville Gas & E	lectric					T				Estimate No.	: 22015B
	& Lundy <sup>LLC</sup>						Ghent Unit 4	1									Project No.	: 10584-022
Chica	igo						Mitigation S			-							<del> </del>	: 12/20/2005
	Cost Type: Est = Estimated, Bid = Vendor quote						Sodium Bistagnitude Co											1/26/2006
							ONFIDENTIA		Wage Rates	Based on:			Louisville	e, KY			Preparer	
									Labor Produ	uctivity =	·			1			Reviewer	:
		;													<u> </u>			
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	<u>DOR</u> (Install)	<u>Total</u> <u>Projected Co</u>
	DCS SYSTEM ADDITIONS Cabinets		Est	1	EA	31,500.00	31,500		40.00	9 40	4(	EHEA	53.92	2,157	7			33,70
	DCS PROGRAMMING/INTERFACE																	
	Interface Hardware Programming /Interface		Est Est	1	EA LT	2,625.00 5,250.00			20.00		20	EHEC WIRE	59.36 69.06					3,80 5,30
	LIGHTING ALLOWANCE		Est	1	LT	15,750.00			150.00		150	INEL	60.02					24,80
,,,			LUI		<u> </u>	10,700.00	13,730		130.00	130	130	1111	00.02	9,000				24,00
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						731,530				2,916			164,329				895,90
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE																
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,675.00	3,675		1250.00	1,250	1,250	PNTR	55.58	69,475				73,20
MISC-2	ROADWORK		Est	0	LS	36,750.00	0		380.00	0	C	PBIT	62.43	0				
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,90
MISC-4	OTHER																	
	PUMP HOUSE 15' X 20'																	
	PREFAB BLDG.			1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,20
	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,20
MISC-5	CFD MODEL STUDY		Est	1	LS	0.00	0		40.00	40	40	STST	86.46	3,458				3,50
MISC-6	TANK BERM		Est	1	LS	61,000.00	61,000		260.00	260	260	STST	86.46	22,480				83,50
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	37,000.00	37,000		60.00	60	60	STST	86.46	5,188				42,20
MISC-8	MISC. SUBTOTAL						150,963				2,215			136,691				287,70
	GENERAL SUPPORT									-								
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,000
	SUBTOTAL						3,331,250			0	12,991			948,321				4,279,700
	Craft Support During Startup	At 3% of Total Manhours					<u></u>				390	MECH	66.86	26,057				26,10

Sargent	110		-			Louis	ville Gas & E									E	Estimate No.	: 22015B
	& Lundy <sup>LLC</sup>						Ghent Unit 4	1									Project No.	: 10584-022
Chica	igo					SO3	Mitigation S	vstem	-									: 12/20/2005
							Sodium Bis						<del>                                     </del>				+	1/26/2006
-	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co						-				+	
				<del> </del>						<u> </u>	İ							: 1/27/2006
							ONFIDENTI	<u> </u>	Wage Rates				Louisville	, KY			Preparer	
									Labor Produ	ctivity =			1				Reviewer	:
<u>item No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
	Allowance for Premium Time Labor																	
i	Productivity Loss Due To Overtime			<u> </u>	- <del> </del>		***************************************										ļ	Not Included
	Per Diem Expense			<del> </del>	- <del></del>													Not Included
	Project Wrap (Efficacy) Insurance				1												ļ	Not Included
	Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs																Not Included
	Erection Contractor's Profit	At 8% of Material and Labor Costs																214,00 342,40
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																Included w\Equipment Costs Included
	Special Tools	Included w\Equipment Costs				·							-					w\Equipment Costs
	Consumables	At 0.5% of Equipment/Material Cost At 4.5% of																16,700
	Freight To Site	Equipment/Material Cost							-		**							
- " -	Taxes - Sales/Use/VAT/Business/Etc.	Equipment/waterial Cost	<u> </u>	<b>l</b>					-									149,900
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																Not Included  By Owner
	SUBTOTAL INSTALLED COST									0	13,380			974,377	·			5,028,800
ENGINE	RING / CONSTRUCTION MANAGEMENT	Furnished by Design Ton			ļ									. 1				
PERMITT	NG, MODELING, ETC.	Furnished by Project Team								0								502,900
STARTUF	P, TESTING AND REAGENT (15 DAYS)			1	<u> </u>				-	0								50.000
CONTING	ENCY	At 20% of Total			<del> </del>					0					-			50,000
CLIENT IN	ITERNAL COST	Furnished by Owner		-					1	<u> </u>								1,116,300
SPARE PA	ARTS			1					1	<u> </u>				· · · · · · · · · · · · · · · · · · ·				100,000 Not Included
	ION .	Not Included							1	U						* **		INOLITICIDADEA
ESCALAT				•	•													
	DURING CONSTRUCTION (AFUDC)	Not Included																

1						Louis	ville Gas & E	lectric								E	stimate No.:	22016B
Sargent 8	Lundy <sup>LLC</sup>						Ghent Unit 4					4					Project No.:	10584-022
^hica						SO3	Mitigation Sy	stem									Date:	12/20/2005
	<u> </u>						ption 5 - Tro										Rev Date	1/27/2006
h —	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co				1						Run Date:	1/27/2006
1							ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer:	
									Labor Produ	ctivity =			1		:		Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure		Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
	DUCTWORK MODIFICATIONS						-											
						****												
	MODIFY GAS DUCT TO ACCEPT INJECTION	•																
DW-1	NOZZLES DUCTWORK MODS		Est	<del>  1</del>	TN	2,625.00	2,625		35.00	35	35		89.66	3,138				5,80
		1/2" INSUL	Est	200	SF	8.40			0.27	54		DINS	59.32	3,203				4,90
DW-2	DUCTWORK SUPPORT STRUCTURES				TN	1,890.00	9,450		16.00	80	80	STST	86.46	6,917				16,40
	STRUCTURAL STEEL ACCESS & GALLERIES		Est Est	5 400	SF	1,890.00	9,450 12,600		0.40	160	160	GALL	71.2	11,392				24,000
	ACCESS & GALLENIES			700	0.													
DW-4	DUCTWORK SUBTOTAL						26,355				329			24,650				51,100
	Injection System						22											
	EQUIPMENT/COMPONENTS								105.00			DI II 4D	05.00					
		0 hp each	Est	6	EA	55,125.00			105.00	630 90	630 90		65.83 65.78	41,473 5,920				372,200 37,400
	VFD Rotary Feeder 3 h	np - Stainless Steel 687,900 lb full - 11,610 ft³ -	Est	3	EA	10,500.00	31,500		30.00	90	90	IAIN	00.78	5,920				37,400
		20.7' - H=83.0' - CS Silo - SS	2	N							2							
1	Days), Unit cost is split between Units 3 and 4 Hor	pper	Est	11	EA	590,000.00	590,000		1624.00	1,624	1,624	TANK	65.78	106,827				696,800
	26	88,800 lb full - 1,160 ft <sup>3</sup> -																
		8.7' - H=39.0' - CS Silo - SS	Est	1	EA	180,000.00	180,000		120.00	120	120	TANK	65.78	7,894				187,900
	Injection Manifold (2 Qtv)	ainless Steel	Est	2	EA	10,500.00	21,000		530.00	1,060	1,060	MECH	66.86	70,872				91,900
	Injection Nozzles (50 Qty)	ainless Steel	Est	1	LT	21,000.00	21,000		540.00	540	540	MECH	66.86	36,104				57,100
	System Piping				<b> </b>	10.10	0.400		0.46	160	160	SPNG	70.4	11,236	<u> </u>			17,700
		cludes fitting allowance	Est	350 0	LF LF	18.48 6.62			0.46	160		INSUL	53.39	11,230				17,700
1 2 2 2 2	Piping Insulation & Lagging		Est Est	0	LF LF	0.00	0		0.00	0	Ö	WIRE	69.06	0				
	Heat Tracing Valves All	lowance	Est	1	LS	1,050.00	1,050		24.75	. 25		SPNG	70.4	1,742	***************************************			2,800
	Supply Piping			İ														
1	Water Supply All	lowance	Est	0	LS	840.00			100.00	0		SPNG	70.4	0				(
		lowance	Est	0	LS	525.00			80.00	0		SPNG	70.4	0				
	Piping Supports All	lowance	Est	1	LS	1,575.00			60.00	60		SPNG	70.4	4,224				5,800
	Piping Back All	lowance CLUDES EXCAVATION &	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
IS-2		ACKFILL	Est	90	CY	157.50	14,175		7.00	630	630	CONP	52.91	33,333				47,500
	STRUCTURAL STEEL		Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
IS-3	AUGER CAST PILES (120 TON CAPACITY) 10	00 ft LONG	Est	2,200	LF	10.00	22,000		0.52	1,144	1,144	PILE	82.81	94,735				116,700
IS-4	IS SYSTEM SUBTOTAL						1,263,518				6,402			442,027				1,705,400
									-									
	MATERIAL UNLOADING SYSTEM						<u> </u>		-									
ASH-1	TRUCK UNLOADING SYSTEM Inc.	cluded in silo	Est	0	Set	105,000.00	0		1254.00	0	0	SPNG	70.4	0		:		
				1	I	i e e e e e e e e e e e e e e e e e e e			1									

				T		Louis	ville Gas & E	Electric									Estimate No	.: 22016B
Sargent 8	k Lundy <sup>LLC</sup>						Ghent Unit 4										Project No	.: 10584-022
Chica						SO3	Mitigation S	vstem									Date	: 12/20/2005
							ption 5 - Tro						<del>                                     </del>					1/27/2006
<b>ነ</b>	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co		<del> </del>				1					: 1/27/2006
							ONFIDENTIA		Wage Rates	Based on:		-	Louisville	KY			Prepare	
							ON IDENTIF		Labor Produ			-	Louisviiie				Reviewe	
									Luborrioud	Journey -					1		Heviewe	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
													-					
	AUXILIARY POWER SUPPLY SYSTEM/I&C															-		
AP-1	POWER SOURCE																	
		Double Ended Unit Substation with (2) 1MVA,																
	480V SWITCHGEAR	6.9-480V XFMR's	Est	1	EA	580,000.00		i i	500.00	500	500	EHEA	53.92	26,960		ľ		607,00
	New Breaker at Existing 4160V Switchgear		Est	1	EA	63,000.00			100.00	100	100	EHEA	53.92	5,392				68,40
	MCC		Est	2	EA	42,000.00	84,000 60,900		200.00 300.00	400			53.92					105,60
	Misc Electrical Equipment & Controls		Est	1	LS	60,900.00	60,900		300.00	300	300	EHEA	53.92	16,176				77,10
AP-2	GROUNDING																	
	Cable - 500kcmil GND		Est	2,000	LF	2.10			0.05		100	WIRE	69.06			1		11,10
ļ	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975	5			6,40
AP-3	CABLE		ļ:					***************************************					<b> </b>		1		<b>_</b>	
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60	0	Routed in 5" Conduit	0.69	0	0	WIRE	69.06					
	Power Cables for MCC's	3/C 500kcmil, 600kV	Est	250	LF	14.70	3,675	Routed in 3" Conduit	0.69	173	173	WIRE	69.06	11,913	3			15,60
*	Power Cables for 480V Switchgear	3/C 4/0kcmil, 5kV	Est	250	LF	8.40	2,100	Routed in 2" Conduit Routed in 1-1/2"	0.35	88	88	WIRE	69.06	6,043	3			8,10
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30	0	Conduit	0.52	_	0	WIRE	69.06		1			
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	150	LF	0.76		Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549			<b> </b>	70
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	LF	1.58		Routed in 3/4" Conduit	0.05		0	WIRE	69.06					, ,
							4 000	Routed in 1-1/2"										
	Power Cables from MCC to Loads - 50 HP	3/C #4, 600V	Est	900	LF	2.10		Conduit Routed in 1-1/2"	0.09	81	81	WIRE	69.06	5,594	<u> </u>			7,50
	Power Cables from MCC to Loads - 100HP	3/C #4/0, 600V	Est	950	LF	9.45	8 978	Conduit	0.50	475	475	WIRE	69.06	32,804	L			41,80
	Power Cables from MCC to Loads - 150HP	3/C #350, 600V	Est	300	LF	10.50		Routed in 2" Conduit	0.69	207	207	WIRE	69.06					17,40
	Control Cables - Pumps	5/C #14, 600V	Est	150	LF	0.67	101	Routed in 3/4" Conduit	0.03	5	5	WIRE	69.06	332				40
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81		Routed in 1-1/2"	0.04			WIRE	69.06					
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25		Routed in 3/4" Conduit	0.03			WIRE	69.06					1,80
	Data Highway Cable		Est	1,000	LF	3.15	3,150	Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210	1			5,40
AP-4	RACEWAY							·										
	3/4" Conduit		Est	2,300	LF	2.06	4,733		0.19	446		ECND	49.67	22,163				26,90
	1-1/2" Conduit		Est	1,850	LF	4.67	8,644		0.28	525	525	ECND	49.67				<u> </u>	34,70
	2" Conduit 3" Conduit		Est Est	550 900	LF LF	6.25 13.13	3,436 11,813		0.35 0.65	194 581	194 581	ECND ECND	49.67 49.67	9,616 28,833				13,10 40,60
	5" Conduit		Est	0	LF LF	38.33	0		1.13	0	0	ECND	49.67	20,033			<u> </u>	40,60
														:				
	DCS SYSTEM ADDITIONS						0.1 80.5											
	Cabinets		Est	11	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,70
AP-8	DCS PROGRAMMING/INTERFACE																	
	Interface Hardware		Est	1	EA	2,625.00	2,625		20.00	20		EHEC	59.36	1,187				3,80
	Programming /Interface		Est	1	LT	5,250.00	5,250		0.00	0		WIRE	69.06	0				5,30
4	LIGHTING ALLOWANCE		Est	1	LT	10,500.00	10,500		100.00	100	100	INEL	60.02	6,002				16,50
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						896,341				4,445			252,428				1,148,90

					T	Louis	ville Gas & E	Electric			·					1	stimate No.:	: 22016B
	& Lundy <sup>LLC</sup>						Ghent Unit 4		+								Project No.	
Chica	ago						Mitigation Sy										Date	: 12/20/2005
	10-47 5-1 5-1 10-1				-		ption 5 - Tro					ļ						<del></del>
	Cost Type: Est = Estimated, Bid = Vendor quote		ļ		-	Order of M	agnitude Co	st Estimate									<b> </b>	: 1/27/2006
			<u> </u>			-0	ONFIDENTIA	<b>4L-</b>	Wage Rates Labor Produ			-	Louisville	e, KY			Preparer:	
		,							Labor Frode	Curry =							neviewei	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	Total Projected Cos
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE	:															
	MISCELLANEOUS	NONE																
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,150.00	3,150		1170.00	1,170	1,170	PNTR	55.58	65,029				68,200
MISC-2	ROADWORK		Est	0	LS	36,750.00	0		380.00	0	0	PBIT	62.43	0				(
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591		7		22,90
MISC-4	OTHER																	
	BLOWER HOUSE				:													
	PREFAB BLDG (15' x 20')	INCLUDES EXCAVATION &		1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,20
	FOUNDATIONS	BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259		Maria de la companya de la companya de la companya de la companya de la companya de la companya de la companya		13,20
MISC-5	CFD MODEL STUDY		Est	1	LS	60,000.00	60,000		40.00	40	40	STST	86.46	3,458				63,50
	TANK BERM		Est	1	LS	0.00	0		260.00	260	260	STST	86.46	22,480				22,50
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	0.00	0		60.00	60	60	STST	86.46	5,188				5,20
MISC-5	MISC. SUBTOTAL	: :					112,438				2,135			132,244				244,70
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,00
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,00
	SUBTOTAL						2,298,651			0	13,312			951,349				3,250,10
	Craft Support During Startup Allowance for Premium Time Labor Productivity Loss Due To Overtime Per Diem Expense	At 3% of Total Manhours									399	MECH	66.86	26,701				26,70 Not Included Not Included Not Included
	Project Wrap (Efficacy) Insurance Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs																Not included Not included 162,50
	Erection Contractor's Profit	At 8% of Material and Labor Costs																260,00
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs											*					Included w\Equipment Costs

						Louis	ville Gas & E	lectric								E	Estimate No.:	: 22016B
Sargent 8	& Lundy LLC						<b>Ghent Unit 4</b>										Project No.:	: 10584-022
≏hica						SO3	Mitigation Sy	/stem									Date	: 12/20/2005
						0	ption 5 - Tro	na									Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote				-		agnitude Co		1				<del> </del>				Run Date	: 1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote								Wage Rates	Daniel and			Louisville	LV.				<del></del>
					-		ONFIDENTIA	\L-	<u> </u>				Louisville	;, KT	<u> </u>		Preparer:	
							-		Labor Produ	ictivity =							Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>S</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
	780007100000000000000000000000000000000																	
																		Included w\Equipment
	Special Tools	Included w\Equipment Costs																Costs
		At 0.5% of					-		1								1	
	Consumables	Equipment/Material Cost							ļ									11,50
		At 4.5% of							1								1	100.40
·	Freight To Site	Equipment/Material Cost							ļ									103,40 Not Included
	Taxes - Sales/Use/VAT/Business/Etc.				ļ												<u></u>	Not included
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
	SUBTOTAL INSTALLED COST										13,711		<u> </u>	978,050				3,814,20
	SOBIOTAL INSTALLED COST			<b> </b>	1													
ENGINE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team		<b>1</b>	1			**************************************		C		÷.						381,400
	TING, MODELING, ETC.									C	)							
	P REAGENT TESTING (15 DAYS)										)							50,000
CONTING		At 20% of Total								C	)							849,100
VTI	NTERNAL COST	To Be Furnished by Owner							ļ	C	)							100,000
(EP	PARTS									C						· ·		Not Included
ESCALAT		Not Included																
INTERES	ST DURING CONSTRUCTION (AFUDC)	Not Included																
										l								F 104 70
	PROJECT TOTAL:		ľ	I	I	I	1		l	1	1		I		1	L		5,194,70

					T	Louis	ville Gas & I	Electric					T		1		stimate No.:	22017B
	& Lundy <sup>LLC</sup>						Ghent Unit										Project No.:	
Chic	ago					SO3	Mitigation S								-			12/20/2005
_							- Vertical FI					<b> </b>					Rev Date	
	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co		1			1	<del> </del>				Run Date:	<b> </b>
1						-(	ONFIDENTI	Δ1 -	Wage Rates	Based on:			Louisville	KV				1/2//2000
									Labor Produ		-	-	Louisville	1			Preparer: Reviewer:	
															1		neviewer.	
<u>Item No</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	<u>Crew</u> <u>Code</u>	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
	DUCTWORK MODIFICATIONS											:						
DW-1	MODIFY GAS DUCT FOR WESP AND TO ACCEPT INJECTION NOZZLES DUCTWORK MODS		Est	0	TN	2,500.00			35.00	(	) (	FLDU	89.66	0				
	INSULATION & LAGGING		Est	0	SF	8.00	0		0.27	(		DINS	59.32	0			-	
DW-4	DUCTWORK SUPPORT STRUCTURES				<u> </u>				<b>-</b>									
	STRUCTURAL STEEL		Est	0	TN	1,800.00	0		16.00			STST	86.46					
	ACCESS & GALLERIES		Est	0	SF	30.00			0.40			GALL	71.2	0				
DW-5	FOUNDATIONS																	
	FOUNDATIONS FOR DUCTWORK AND STRUCTURAL STEEL	INCLUDES EXCAVATION & BACKFILL	Est	0	CY	150.00	0		7.00	C		CONP	52.91	0				
DW-6	AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	0	LF	10.00	0		0.52			PILE	82.81					
	DUCTWORK SUBTOTAL				<u> </u>	10.00			0.52			PILE	82.81	. 0				(
	DOCTWORK SUBTUTAL						0				0			0				
	WESP & ASSOCIATED EQUIP																	
WE-1	EQUIPMENT/COMPONENTS																	
WE-2	WESP ( One ESP boxes, with three fields, 6 feet	INCLUDES ALL ASSOCIATED DUCTWORK AND WASTE WATER EQUIPMENT.PIPING AND TANKS RETURN TO EXISTING	Est	1	EA	28,945,000.00		BUDGETARY INPUT FROM VENDORS	76901	76,901	76,901	PREC	86.72	6,668,871				35,613,900
WE-3	Chimney Liner Adjustment	CHIMNEY	Est	0	LF	-5302.50	0		-55	0	0	PREC	86.72	0				(
WE-4	Chimney Breaching Adjustment	NONE	Est	0	LS	0.00	0		o	0	0	PREC	86.72	0				
		INCLUDES EVONVATION S																
	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	210	CY	157.50	33,075		7.00	1,470	1,470	CONP	52.91	77,778				110,900
WE-6	AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	0	LF	10.00	0		0.52	0	0	PILE	82.81	<del></del>				(
WE-7	FIBERGLASS DUCT			50	LF	7,200.00	360,000		50.00	2,500		DUCT	82.81	207,025				567,000
NE-8	WE SYSTEM SUBTOTAL						29,338,075				80,871			6,953,674				36,291,800
	AUXILIARY POWER SUPPLY													-,3,				33,201,000
	SYSTEM/I&C																1	
\P-1	POWER SOURCE																	
	SWITCHGEAR	Double Ended Unit Substation with (2) 2MVA, 6.9- 480V XFMR's	Est	2	EA	575,000.00	1,150,000		500.00	1,000	1 000	EHEA	53.92	E2 000				4 000 000
	New Breaker at Existing 13.2kV Switchgear		Est	2	EA	63,000.00	126,000		100.00	200	200	EHEA	53.92	53,920 10,784				1,203,900 136,800
<u>†</u>	MÇC	· · · · · · · · · · · · · · · · · · ·	Est	2	EA	52,500.00	105,000		240.00	480	480	EHEA	53.92	25,882				130,800

			1	T .	1	1			T	T		1-	T	T	1	T T	***************************************	Ţ
Sargant I	│ & Lundy <sup>LLC</sup>					Louis	ville Gas & E										stimate No.:	
Chica						000	Ghent Unit 4			-							Project No.:	
Cilica	lgo 						Mitigation S			-								12/20/2005
_	Continue Est. Setimated Bid. Vender		-				- Vertical Flo			ļ		ļ.					Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote		_				lagnitude Co										Run Date:	1/27/2006
						<b>-C</b>	ONFIDENTIA	AL-	Wage Rates				Louisville	, KY			Preparer:	
			<u> </u>				<u> </u>		Labor Produ	uctivity =	·		1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Co
	Misc Electrical Equipment & Controls		Est	1	LS	86,100.00	86,100		504.00	504	504	EHEA	53.92	27,176				113,30
AD 0	ODOLINDINO					•												-
AP-2	GROUNDING Cable - 500kcmil GND	-	Est	2,000	LF		4 000		1			W.55				***		
	Grounding Rod		Est	12	EA	2.10 199.50			0.05 4.00	100	100	WIRE PILE	69.06 82.81	6,906 3,975				11,10
			1	<del>                                     </del>	/\	199.50	2,094		4.00	1 48	48	LILE	02.81	3,975	<b>-</b>			6,40
	CABLE			1	<b></b>					1		<u> </u>						
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	100	LF	33.60		Routed in 5" Conduit	0.69	69	69	WIRE	69.06	4,765				8,10
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	0	LF	14.70		Routed in 3" Conduit	0.69		0	WIRE	69.06	0				
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	1,000	LF	8.40	8,400	Routed in 2" Conduit	0.35	350	350	WIRE	69.06	24,171				32,60
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	3,600	LF	6.00	00.000	Routed in 1-1/2"	0.50	4 070								
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #2/0, 600V	Est	0	LF	6.30 0.76		Conduit Routed in 3/4" Conduit	0.52 0.05	1,872	1,8/2	WIRE WIRE	69.06	129,280				152,00
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	1,500	ĹF	1.58		Routed in 3/4" Conduit	0.05	80	80	WIRE	69.06 69.06	5,490				7,90
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	0	LF	2.12	0	Routed in 1-1/2" Conduit	0.09	0	0	WIRE	69.06	0				
	Dawer Cables from MCC to Loads - FOLID	0/0 // 000//	1					Routed in 1-1/2"	i e									
	Power Cables from MCC to Loads - 50HP Power Cables from MCC to Loads - 60HP	3/C #4, 600V 3/C #2, 600V	Est Est	0	LF LF	2.67 3.58	0	Conduit	0.35	0	0	WIRE	69.06	0				
	Control Cables - Pumps	5/C #2, 600V 5/C #14, 600V	Est	1,500	LF LF	3.58 0.67		Routed in 2" Conduit Routed in 3/4" Conduit	0.35 0.03	48	0	WIRE	69.06 69.06	0 3,315				4.00
	CONTROL CADIGO 1 AMPO	3/3 # 14, 000 \$		1,500		0.07	1,008	Routed in 1-1/2"	0.03	40	48	WIRE	69.06	3,315				4,30
	Control Cables - TR Sets	7/C #14, 600V	Est	3,600	LF	0.81	2,911	Conduit	0.04	144	144	WIRE	69.06	9,945				12,90
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25		Routed in 3/4" Conduit	0.03			WIRE	69.06	1,657				1,80
	Data Highway Cable		Est	1,000	LF	3.15	3,150	Routed in 3/4" Conduit	0.03	32		WIRE	69.06	2,210				5,40
AD 4	DAGEWAY		ļ				***************************************											
AP-4	RACEWAY 3/4" Conduit		<del> </del>	4.750			0 770											
	1-1/2" Conduit		Est Est	4,750 3,600	LF ·	2.06 4.67	9,776 16,821		0.19 0.28	· · · · · ·	922	ECND	49.67	45,771				55,50
	2" Conduit		Est	1,000	LF	6.25	6,248		0.28	1,022 352	1,022	ECND ECND	49.67 49.67	50,783 17,484				67,60
	3" Conduit		Est	0	LF	13.13	0,240		0.65	0	002	ECND	49.67	17,404				23,70
	5" Conduit		Est	100	LF	38.33	3,833		1.13	113	113	ECND	49.67	5,598				9,40
	DOO OVOTELLA DELETIONS																	
	DCS SYSTEM ADDITIONS Cabinets		l			04 500 55	0.55	:										
	Cauriets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,70
AP-8	DCS PROGRAMMING/INTERFACE		<b>-</b>															,
	Interface Hardware		Est	1	EA	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187				3,800
	Programming /Interface		Est	1	LT	5,250.00	5,250		0.00	0		WIRE	69.06	0		****		5,300
AP-9	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.00	0.000				04.604
			Lot	I	LI	15,750.00	13,730		150.00	150	150	IINEL	60.02	9,003				24,800
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						1,609,556		·		7,569			441,458				2,051,200
										,	.,,000			171,700				2,001,200
	REINFORCING OF EXISTING EQUIPMENT	NONE .																
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE		:- :			:											
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	87150.00	87,150		3250.00	3,250	3,250	PNTR	55.58	180,635				267,800

						Louis	ville Gas & E	=lectric			T	T	1	T	1		Estimate No.:	000170
Sargent	& Lundy <sup>LLC</sup>						Ghent Unit 4								1		Project No.:	
Chica	ago					SO3	Mitigation S					1					·	12/20/2005
<b>∤</b>							i - Vertical Fl			-		a i					Rev Date	
	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co										Run Date:	1/27/2006
			-			-6	ONFIDENTIA	AL-	Wage Rates		ļ	1	Louisville	, KY			Preparer:	
									Labor Prod	uctivity =			1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> <u>Equipment or</u> <u>Material Cost</u>	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	<u>Crew</u> <u>Code</u>	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
MISC-2	ROADWORK	20' WIDTH X 1000 LF GRAVEL	Est	1	LS	46000.00	46,000		380.00	380	380	PBIT	62.43	23,723				69,700
MISC-3	STORM DRAINAGE		Est	1	LS	7350.00	7,350		300.00	300		:						
MISC-4						7000.00	7,000		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-5	MISC. SUBTOTAL						140,500				3,930			219,949				360,400
MISC-1	PAINTING	Touch-up and Field Finish	Est	0	LS		0		3250.00	0	. 0	PNTR	55.58	0				(
MISC-2	ROADWORK	20' WIDTH X 1000 LF GRAVEL	Est	0	LS		0		475.00	0	0	PBIT	62.43	0		·		C
WISC-3	STORM DRAINAGE		Est	0	LS		0		538.43	0	0	YDRN	51.97	0				(
N4	OTHER										***************************************			****		- ·		
	CFD MODEL STUDY		Est	1	LS	0.00	0		40.00	40	40	STST	86.46	3,458				3,500
MISC-5	MISC. SUBTOTAL						0				40			3,458				3,500
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0	Includes freight in and						100,000				100,000
GS-2	CRANE RENTAL	700 Ton - 4 months	Est	11	LT			out						480,000				480,000
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			580,000				580,000
	SUBTOTAL						31,088,131	· · · · · · · · · · · · · · · · · · ·		0	92,410	:		8,198,540				39,286,900
	Craft Support During Startup Allowance for Premium Time Labor	At 3% of Total Manhours									2,772	MECH	66.86	185,357				185,400 Not Included
	Productivity Loss Due To Overtime Per Diem Expense										•							Not Included Not Included
	Project Wrap (Efficacy) Insurance Erection Contractor's General & Administrative	At 5% of Material and Labor																Not Included
	Costs Erection Contractor's Profit	Costs - WESP At 8% of Material and Labor Costs - WESP																517,100
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs															- 1	827,400 Included w\Equipment Costs Included
	Special Tools	Included w\Equipment Costs At 0.5% of																w\Equipment Costs
	Consumables	Equipment/Material Cost																155,400

						Louis	ville Gas & E	lectric									Estimate No.	: 22017B
Sargent 8	Lundy <sup>LLC</sup>						<b>Ghent Unit 4</b>										Project No.	: 10584-022
Chica						SO3	Mitigation Sy	/stem	T									: 12/20/2005
						Option 6	- Vertical Flo	w WESP									<del></del>	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote			<del>                                     </del>			lagnitude Co		<del> </del>		<u> </u>							<del></del>
	,				1													: 1/27/2006
			ļ			-(	ONFIDENTIA	\L-	Wage Rates		-		Louisville	, KY			Preparer	
			<u> </u>						Labor Produ	ctivity =			1				Reviewer	:
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cost
			<u> </u>	1														
	Freight To Site	At 4.5% of Equipment/Material Cost																1,399,000
	Taxes - Sales/Use/VAT/Business/Etc.		İ						1								-	Not Included
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																
	CONTRACTOR	T difficiled by CWHEI																By Owner
	SUBTOTAL INSTALLED COST		,							0	95,183			8,383,896				42,371,200
ENGINEE	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team	ļ							0							<b></b>	4 000 700
PERMITTI	NG, MODELING, ETC.	T difficiled by 1 toject 1 dain								0							<u> </u>	1,906,700
STARTUP	AND TESTING				2					0								100,000
CONTING	ENCY	At 20% of Total								0							<b></b>	8,875,600
	ITERNAL COST	To Be Furnished by Owner								0							<b> </b>	200,000
SPARE PA										0							1	Not Included
ESCALAT		Not Included																0
NIERES	DURING CONSTRUCTION (AFUDC)	Not Included		ļ														0
	PROJECT TOTAL :			<b></b>													l	

						Louis	ville Gas & I	Electric				T	1		T		Estimate No.:	- 22018B
Sargent	& Lundy <sup>LLC</sup>						Ghent Unit			1:							Project No.:	
Chica					-		Mitigation S					-						
, 011100					<del> </del>								-				<del></del>	: 12/20/2005
,					-		Horizontal		-								Rev Date	<del> </del>
-	Cost Type: Est = Estimated, Bid = Vendor quote			ļ				ost Estimate	:								Run Date:	: 1/27/2006
						-C	ONFIDENTI	AL-	Wage Rates				Louisville	e, KY			Preparer:	:
							ļ ·		Labor Produ	uctivity =				1			Reviewer:	:
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment of Material Cost	r Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
															?			
	DUCTWORK MODIFICATIONS	COSTS								1								
	WEED & ACCOUNTED FOUR			ļ	<b> </b>				<b></b>	<u> </u>			<b>_</b>		<b> </b>		<u> </u>	
	WESP & ASSOCIATED EQUIP			<b></b>	<b> </b>				-						<u> </u>		<b> </b>	
-				<b> </b>	<del> </del>				<b>-</b>						<b></b>	·		
	WESP (Two ESP boxes, with 29 feet three fields, 9 feet long 1st field at 9.75" spacing with 76 gas passages, and 11 feet long 2nd and 3rd fields at 11.75" spacing with 64 passages, total 170 SCA. All internal 2205, with 2205 carbon steel clad alloy plate construction)		Est	1	EA	31,570,000.00	31,570,000	BUDGETARY INPUT FROM VENDOR	142817	142,817	142,817	PREC	86.72	12,385,047				43,955,00
	Chimney Liner Adjustment ( WITH MODIFIED	RETURN TO EXISTING								<u> </u>			ļ					
		BREECHING	Est	0 1	LF	5,302.50			55	,	,	PREC	86.72	,				
VV LZ	DILECTING AT WEST OUTLET LEEVATION)	BREEOFING	ESI		<u> </u>	5,302.50		)	33	<u> </u>	ļ	PREC	00.72	U	<u> </u>			
WE-3	Chimney Breaching Adjustment		Est	0	LS	21,000.00		)	220			PREC	86.72					
				l – Š		2.1,000.00			1	l	l		55.72	l				
4	Electrical Building	20'x40'	Est	1	EA	21,000.00	21,000		100.00	100	100	STST	86.46	8,646		Mark 2011 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		29,60
-																		- 1
		INCLUDES EXCAVATION &																
	FOUNDATIONS	BACKFILL	Est	810	CY	157.50			7.00				52.91	300,000				427,60
	STRUCTURAL STEEL	100 # LONG	Est	170	TN	2,200.00			16.00	2,720	2,720	STST	86.46					609,20
	AUGER CAST PILES (120 TON CAPACITY) FIBER GLASS DUCT 23' DIA	100 ft LONG	Est	2,000	LF LF	10.00			0.52	1,040			82.81	86,122		***************************************		106,10
	WE SYSTEM SUBTOTAL		Est	450	<u> </u>	7,200.00	3,240,000 <b>35,352,57</b> 5		50.00	22,500	22,500 <b>174,847</b>	DUCT	59.32	1,334,700 <b>14,349,686</b>				4,574,70 <b>49,702,20</b>
0	OTOTEM CODIOTAL						00,002,075		<u> </u>		174,047			14,348,000				45,102,20
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE																	
	SWITCHGEAR	Double Ended Unit Substation with (2) 2MVA, 6.9 480V XFMR's	Est	1	EA	575,000.00			500.00	500 100		EHEA	53.92	26,960				602,00
	New Breaker at Existing 13.2kV Switchgear		Est	1	EA	63,000.00	63,000		100.00	100		EHEA	53.92	5,392				68,400
	MCC Misc Electrical Equipment & Controls		Est	2	EA	52,500.00	105,000		240.00	480	480	EHEA	53.92	25,882				130,90
	iviisu Electricai Equipment & Controls		Est		LS	86,100.00	86,100		324.00	324	324	EHEA	53.92	17,470				103,60
AP-2	GROUNDING																	
	Cable - 500kcmil GND		Est	2,000	LF	2.10	4,200		0.05	100	100	WIRE	69.06	6,906				11,100
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48		82.81	3,975				6,400
	CABLE Days Calabar for MOOI	0.00 = 501		100				B				11//						
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	100	LF	33.60		Routed in 5" Conduit	0.69	69		WIRE	69.06	4,765				8,100
	Power Cables for MCC's Power Cables for Switchgear	3/C 500kcmil, 5kV 3/C 4/0kcmil, 5kV	Est Est	0 1,000	LF LF	14.70 8.40		Routed in 3" Conduit Routed in 2" Conduit	0.69 0.35	0 350		WIRE WIRE	69.06 69.06	0 24,171				32,600
	Tomer Dables for Owitchigeal	U/O 4/OROHIII, UKV	⊏St	1,000	LF	0.40	0,400	Routed in 1-1/2"	0.33	350	350	AA IUE	09.06	<u> </u>				32,00
l <sub>1</sub>	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	2,400	LF	6.30	15.120	Conduit	0.52	1,248	1.248	WIRE	69.06	86,187				101,30
		3/C #10, 600V	Est	0	LF	0.76		Routed in 3/4" Conduit	0.05	0		WIRE	69.06	00,.37				701,00
		3/C #8, 600V	Est	1,500	LF	1.58	2,363	Routed in 3/4" Conduit	0.05	80		WIRE	69.06	5,490				7,900
								Routed in 1-1/2"										·
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	0	LF	2.12	0	Conduit	0.09	-0	0	WIRE	69.06	0		<u> </u>		<u> </u>

F.						Louis	ville Gas & E			T T							Estimate No.:	: 22018B
	& Lundy <sup>t:LC</sup>						Ghent Unit	4				-					Project No.:	: 10584-022
Chica	go					SO3	Mitigation S	ystem									Date:	: 12/20/2005
ļ <u> </u>							Horizontal F										Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote				-			st Estimate									Run Date:	1/27/2006
				-	ļ	-C	ONFIDENTI	AL-	Wage Rates			-	Louisville	e, KY			Preparer:	
					1				Labor Produ	ictivity =			1				Reviewer:	:
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract S	DOR (Furnish)	DOR (Install)	Total Projected Cos
								Routed in 1-1/2"										
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V	Est	0	LF	2.67		Conduit	0.35	c	c	WIRE	69.06	0				1
<u> </u>	Power Cables from MCC to Loads - 60HP	3/C #2, 600V	Est	0	LF	3.58		Routed in 2" Conduit	0.35	C	0	WIRE	69.06	0				
<u> </u>	Control Cables - Pumps	5/C #14, 600V	Est	1,500	LF	0.67	1,008	Routed in 3/4" Conduit Routed in 1-1/2"	0.03	48	48	WIRE	69.06	3,315				4,30
	Control Cables - TR Sets	7/C #14, 600V	Est	2,400	LF	0.81	1,940	Conduit	0.04	96	96	WIRE	69.06	6,630	. ,			8,60
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25	189	Routed in 3/4" Conduit	0.03	24	24	WIRE	69.06	1,657				1,80
<u> </u>	Data Highway Cable		Est	1,000	LF	3.15	3,150	Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210				5,40
AP-4	RACEWAY								<u> </u>	-								
	3/4" Conduit		Est	4,750	LF	2.06			0.19	922	922	ECND	49.67	45,771				55,500
	1-1/2" Conduit		Est	2,400	LF	4.67	11,214		0.28	682	682	ECND	49.67	33,855				45,100
	2" Conduit 3" Conduit	· · · · · · · · · · · · · · · · · · ·	Est	1,000 0	LF LF	6.25 13.13	6,248		0.35 0.65	352	352		49.67	17,484				23,700
	5" Conduit		Est Est	100	LF	38.33	3,833		1.13	113	113	ECND ECND	49.67 49.67	5,598				9,400
AP-5	DCS SYSTEM ADDITIONS																	
A1 -3	Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,700
	DCS PROGRAMMING/INTERFACE																	
	Interface Hardware		Est	1 1	EA	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187				3 800
	Programming /Interface		Est	1	LT	5,250.00	5,250		0.00	0	0	WIRE	69.06	0				3,800 5,300
AP-9	LICUTING ALLOWANGE		F-1		ļ	45 750 00	45 750		450.00	150								
AP-9	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,800
AD 10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						957,418				F 770			000 005				
AF-10	AUXILIANT FOWER STSTEM / I&C SUBTOTAL						957,416				5,776			336,065				1,293,70
	REINFORCING OF EXISTING EQUIPMENT	NONE								·								
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE																
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	87,150.00	87,150		3250.00	3,250	3,250	PNTR	55.58	180,635				267,800
		20' WIDTH X 1000 LF																
MISC-2	ROADWORK	GRAVEL	Est	1	LS	45,937.50	45,938		380.00	380	380	PBIT	62.43	23,723				69,700
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4	OTHER											-		:				
MISC-5	CFD MODEL STUDY		Est	1	LS	0.00	0		40.00	40	40	STST	86.46	3,458				3,500
	MISC. SUBTOTAL						140 400			·								
IVIIOU-5	WIGO. GUDIUI AL						140,438				3,970			223,408				363,900
	CENEDAL CUDDODT																	
	GENERAL SUPPORT						· · · · · · · · · · · · · · · · · · ·						e C				•	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0	<u> </u>						100,000				100,000

						Louis	ville Gas & E		T					T			Estimate No	- 22018B
Sargent	& Lundy <sup>LLC</sup>						Ghent Unit										·	.: 10584-022
Chica							Mitigation S		-							<del> </del>	<del></del>	: 12/20/2005
-				+		Ontion 7	Usei-setal I	yaleiii	<u> </u>				ļ			-	·	
_				-	-		Horizontal F							<u> </u>			+	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co				and the same of th						Run Date	: 1/27/2006
						-C	ONFIDENTI	AL-	Wage Rates	Based on:			Louisville	, KY			Prepare	r:
									Labor Produ	ctivity =	•		1				Reviewe	:
<u> </u>																		
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost		Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
			.:															
GS-2	CRANE RENTAL	700 Ton - 2 months	Est	1	LT			Includes freight in and out						310,000				310,000
GS-2	GENERAL SUPPORT SUBTOTAL						0			-	0			410,000				410,000
	SUBTOTAL						36,450,431			0	184,593			15,319,159	1			51,769,800
																		(
	Craft Support During Startup	At 3% of Total Manhours			ļ						5,538	MECH	66.86	370,256				370,300
	Allowance for Premium Time Labor			ļ	<b></b>													Not Included
	Productivity Loss Due To Overtime Per Diem Expense			<b> </b>						***************************************								Not Included
<b> </b>	Project Wrap (Efficacy) Insurance			<b>_</b>	<b>!</b>		<u> </u>								*************		<u> </u>	Not Included
	Erection Contractor's General & Administrative	At 5% of Material and Labor		1							·····	~~~~						Not Included
	Costs	Costs - WESP At 8% of Material and Labor																1,010,000
	Erection Contractor's Profit	Costs - WESP																1,616,000
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs					·		e .				·					Included w\Equipment Costs
																7.7		Included
	Special Tools	Included w\Equipment Costs At 0.5% of																w\Equipment Costs
	Consumables	Equipment/Material Cost																182,300
	Freight To Site	At 4.5% of Equipment/Material Cost				·												1,640,30
	Taxes - Sales/Use/VAT/Business/Etc.	=qaipinonininiatoriai oost																Not Included
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
																		1
	SUBTOTAL INSTALLED COST									0	190,131			15,689,415				56,588,700
	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team								0				- ,				2,546,000
PERMITT	ING, MODELING, ETC.									Ó	*******************************					· · · · · · · · · · · · · · · · · · ·		0
STARTU	P AND TESTING									0								100,000
CONTING		At 20% of Total								0								11,846,900
CLIENT II	NTERNAL COST	To Be Furnished by Owner								0								200,000
SPARE P	ARTS									0	·							Not included
ESCALAT		Not Included																(
	T DURING CONSTRUCTION (AFUDC)	Not Included								<u> </u>								0
ontroletas con c	PROJECT TOTAL :									0								71,281,600

ca	k Lundy <sup>LLC</sup>						ville Gas & E	icoti io									stimate No.:	
ca		· · · · · · · · · · · · · · · · · · ·			1	i N/	ill Creek Unit	3									Project No.:	10584-022
							Mitigation Sy						·					12/20/2005
	30						n 1 - Hydrate										Rev Date	ļ
									-									1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co		10/ D-1	Daniel and			Louisville,	LV.				1/2//2000
						-C	ONFIDENTIA	L-	Wage Rates				Louisville,	KY			Preparer:	
		A STATE OF THE STA							Labor Produ	ctivity =			1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod =1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Co
	DUCTWORK MODIFICATIONS																	
				<u> </u>														
1	MODIFY GAS DUCT TO ACCEPT INJECTION	1																
DW-1	NOZZLES DUCTWORK MODS		Est	1 1	TN	2,625.00	2,625		35.00	35	35	FLDU	89.66	3,138				5,80
<u> </u>	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40			0.27	54	54	DINS	59.32	3,203				4,90
	INCOLATION & LAGGING																	
DW-2	DUCTWORK SUPPORT STRUCTURES					4 000 00	9,450		16.00	80	Λα	STST	86.46	6,917				16,40
	STRUCTURAL STEEL		Est	5	TN SF	1,890.00 31.50			0.40	160		GALL	71.2	11,392				24,00
	ACCESS & GALLERIES		Est	400	or .	31.50	12,000		10	,,,,			. ,	,				
DW-4	DUCTWORK SUBTOTAL						26,355				329			24,650				51,10
	Injection System																	
																:		
โ	EQUIPMENT/COMPONENTS			1	<del> </del>	55,125.00	275,625		105.00	525	525	PUMP	65.83	34,561				310,20
	7 11. 210770.0	150 hp each	Est	5 3	EA EA	10,500.00			30.00	90		TANK	65.78	5,920				37,40
	VFD Rotary Feeder	3 hp - Stainless Steel 2,020,600 lb full - 13,492 ft³ -	Est	1 3	<u> </u>	10,300.00	01,000		1 00.00									
	Long-Term Storage Silo - Common for 2 Units (10	D=16.3' - H=65.2' - CS Silo - SS								0.540	0.540	TANK	05.70	107 144				010.40
	Days) Unit cost is split between Units 3 and 4	Hopper	Est	1	EA	645,000.00	645,000		2545.52	2,546	2,546	TANK	65.78	167,444				812,40
		202,100 lb full - 1,350 ft <sup>3</sup> -	-															
		D=7.5' - H=30.0' - CS Silo - SS	Est	1	EA	162,000.00	162,000		764.00	764	764	TANK	65.78	50,256				212,30
		Hopper Stainless Steel	Est	2	EA	10,500.00	21,000		240.00	480	480	MECH	66.86	32,093 16,046				53,10 26,50
	Injection Nozzles (50 Qty)	Stainless Steel	Est	1	LT	10,500.00	10,500		240.00	240	240	MECH	66.86	16,046				26,50
	System Piping									404	101	CDNC	70.4	44.004				17.00
	8" - CS	Includes fitting allowance	Est	350	LF LF	18.48			0.46	161		SPNG INSUL	70.4 53.39	11,334				17,80
	Piping Insulation & Lagging		Est	0	LF	6.62			0.14 0.00	0	0	WIRE	69.06	0				
	Heat Tracing		Est	0	LF	1,050.00			24.75	25		SPNG	70.4	1,742				2,80
	Valves	Allowance	Est	1 1	LS	1,050.00	1,050		24.13	-20	20	2		1,172				
	Supply Piping	Allawana	Est	1 0	LS	840.00	0 0		100.00	0	О	SPNG	70.4	0				
	Water Supply	Allowance	Est	1 0	LS	525.00			80.00	0	0	SPNG	70.4	0				
	Air Supply	Allowance Allowance	Est	1 1	LS	1,575.00			60.00	60	60	SPNG	70.4	4,224				5,80
	Piping Supports	Allowance	Est	10	TN	2,200.00			16.00	160	160	STST	86.46	13,834				35,80
<u> </u>	Piping Rack	INCLUDES EXCAVATION &			T												/	
IS-2		BACKFILL	Est	50	CY	157.50			7.00	350	350	CONP STST	52.91 86.46	18,519				26,40 35,80
IS-3	STRUCTURAL STEEL		Est	10	TN	2,200.00			16.00 0.52	160 1,144	160	PILE	86.46	13,834 94,735				35,80 116,70
IS-4	AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	2,200	LF	10.00	22,000		0.52	1,144	1,144	1 166	02.01	37,700				
IS-5	IS SYSTEM SUBTOTAL						1,228,593				6,704			464,542				1,693,00
	MATERIAL UNLOADING SYSTEM																	
_	TRUOK DELIVEDY	INCLUDED IN SILO	Est	0	Set	315,000.00	0		1753.67	0	O	SPNG	70.4	0				
, ,	TRUCK DELIVERY AUXILIARY POWER SUPPLY	INCLUDED IN SILO	LSI		1	0.0,000.00												:
	SYSTEM/I&C				Section 1997		1											
																		L

						Louis	ville Gas & E	lectric								E	stimate No.:	21984B
Sargent &	Lundy <sup>LLC</sup>						ill Creek Uni										Project No.:	10584-022
Sargerit d							Mitigation S		1								Date:	12/20/2005
-	<del>-</del>						n 1 - Hydrate		1								Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co										Run Date:	1/27/2006
	- Tendor quote						ONFIDENTIA		Wage Rates	Based on:			Louisville	. KY			Preparer	<del> </del>
							ON IDENTIA	<b>7L</b>	Labor Produ			<del> </del>	Louisviiis	1	<u> </u>		Reviewer	
<u> </u>							<del>                                     </del>		Laborriode	Curry =							Tieriene.	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
		Double Ended Unit Substation																
	400V CANTOLICEAD	with (2) 2MVA, 6.9-480V XFMR's	Ect	1	EA	575,000.00	575,000	ŀ	500.00	500	500	EHEA	53.92	26,960				602,00
	480V SWITCHGEAR New Breaker at Existing 6900V Switchgear	AFIVIN S	Est Est	1	EA	63,000.00	63,000		100.00	100	100		53.92					68,40
	MCC		Est	2	EA	42,000.00	84,000		200.00	400		EHEA	53.92	21,568				105,60
	Misc Electrical Equipment & Controls		Est	1 1	LS	60,900.00	60,900		300.00	300	300		53.92					77,10
	GROUNDING											1400==						
	Cable - 500kcmil GND		Est	2,000	LF.	2.10			0.05	100	100		69.06					11,10
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,40
LAD C	CARLE			<u> </u>	<u> </u>				<b> </b>									
	CABLE Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60	1	Routed in 5" Conduit	0.69	0	0	WIRE	69.06	0				
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	<del>  □</del>	14.70		Routed in 3" Conduit	0.69	173	173		69.06					15,60
	Power Cables for 480V Switchgear	3/C 4/0kcmil, 5kV	Est	0	T LF	8.40		Routed in 2" Conduit	0.35	0	0	WIRE	69.06					,
	1 One. Odbies for 400 v Owiterigeal	5,5 working one			1		1	Routed in 1-1/2"										
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30		Conduit	0.52	0	0	WIRE	69.06	0				
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	150	LF	0.76	113	Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06					700 800
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	150	LF	1.58	236	Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549				800
	Power Cables from MCC to Loads - 50 HP	3/C #4, 600V	Est	150	LF	2.10	315	Routed in 1-1/2" Conduit Routed in 1-1/2"	0.09	14	14	WIRE	69.06	932				1,20
	Power Cables from MCC to Loads - 100HP	3/C #4/0, 600V	Est	150	LF	9.45	1.418	Conduit	0.50	75	75	WIRE	69.06	5,180				6,60
	Power Cables from MCC to Loads - 100HP	3/C #4/0, 600V	Est	300	LF	10.50		Routed in 2" Conduit	0.69	207	207	WIRE	69.06	14,295				17,40
	Control Cables - Pumps	5/C #14, 600V	Est	150	LF	0.67		Routed in 3/4" Conduit	0.03	5	5	WIRE	69.06					40
	CONTROL CADIOC T GINED							Routed in 1-1/2"			÷							
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81	0	Conduit	0.04	0	0	WIRE	69.06	0				
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25	189	Routed in 3/4" Conduit	0.03	24 32	24	WIRE	69.06	1,657				1,80
	Data Highway Cable		Est	1,000	LF LF	3.15	3,150	Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210				5,40
<u>                                     </u>	DAOSWAY			-	ļ		<b> </b>									***		
	RACEWAY		Est	2,300	LF	2.06	4,733		0.19	446	446	ECND	49.67	22,163				26,90
	3/4" Conduit 1-1/2" Conduit		Est	300	LF	4.67			0.13	446 85	85	ECND	49.67	4,232				5,600
	2" Conduit		Est	300	LF	6.25			0.35	106	106	ECND	49.67	5,245			:	7,10
	3" Conduit		Est	900	LF	13.13	11,813		0.65	581	581	ECND	49.67	28,833				40,60
	5" Conduit		Est	0	LF	38.33			1.13	0	0	ECND	49.67	0				
									<u> </u>									
	DCS SYSTEM ADDITIONS		-	<u> </u>		24 522 52	04 500		40.00			CLICA	E0.00	0 4.57				00.70
<b> </b>	Cabinets		Est	1 1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,70
AD O	DOS DECORANAMINO (INTEREACE			<b>l</b>	<b> </b>					-								
	DCS PROGRAMMING/INTERFACE Interface Hardware		Est	1 1	EA	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187				3,800
	Programming /Interface		Est	1 1	LT	5,250.00			0.00	0		WIRE	69.06	0				5,300
	, rog.a.ming/monaco																	
AP-9	LIGHTING ALLOWANCE		Est	1	LT	10,500.00	10,500		100.00	100	100	INEL	60.02	6,002				16,50
				ļ														
				ļ	<u> </u>		871,538				3,370			188,413				1,060,00
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL			1			671,538				3,370			100,413		:		1,000,00
	DEINICODONIO OF EVICTINO				-											***************************************		
1	REINFORCING OF EXISTING EQUIPMENT	NONE	· · · · · · · · · · · · · · · · · · ·															
ļ				1	<b> </b>	t.								<u> </u>				
	DEMOLITION / RELOCATIONS	NONE		<u> </u>					Ll		1				1		1	

						Louis	ville Gas & E	lectric		T					T	E	stimate No.:	: 21984B
Sargent &	k Lundy <sup>LLC</sup>						ill Creek Uni						1				Project No.:	
Chica						<del></del>	Mitigation Sy											: 12/20/2005
							n 1 - Hydrate										Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate									Run Date:	: 1/27/2006
							ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer:	:
									Labor Produ	ictivity =			1				Reviewer:	
		_	<u> </u>															
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	<u>Unit of</u> <u>Measure</u>	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
	MISCELLANEOUS	NONE																
											,							
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,150.00	3,150		1170.00	1,170	1,170	PNTR	55.58	65,029				68,20
MISC-2	ROADWORK		Est	0	LS	36,750.00	0		380.00	0	0	PBIT	62.43	0				
MISC-3	STORM DRAINAGE		Est	0	LS	7,350.00	0		300.00	0	0	YDRN	51.97	0				1
MISC-4	OTHER																	
,	BLOWER HOUSE	INCLUDES EXCAVATION &						***************************************								:		
	FOUNDATIONS	BACKFILL	Est	25	CY	157.50	3,938		7.00	175 130	175	CONP	52.91	9,259				13,20
	PREFAB BLDG. 15'X20'		Est	1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,20
MISC-5	CFD MODEL STUDY		Est	1	LS	30,000.00	30,000		40.00	40	40	STST	86.46	3,458				33,500
ı. ,-6	TANK BERM		Est	1	LS	0.00	0		260.00	260	260	STST	86.46	22,480				22,500
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	0.00	0		60.00	60	60	STST	86.46	5,188	i v			5,20
MISC-5	MISC. SUBTOTAL						75,088				1,835			116,653				191,80
	<u>-</u>																	
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							150,000				150,00
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			150,000				150,000
	SUBTOTAL						2,201,574				10.000							
	SUBTOTAL						2,201,574			0	12,238			944,258				3,145,90
	Craft Support During Startup	At 3% of Total Manhours									367	MECH	66.86	24,548				24,500
	Allowance for Premium Time Labor Productivity Loss Due To Overtime																	Not Included Not Included
	Per Diem Expense								***************************************									Not Included
	Project Wrap (Efficacy) Insurance Erection Contractor's General & Administrative	At 5% of Material and Labor																Not Included
	Costs	Costs	•															157,300
	Erection Contractor's Profit	At 8% of Material and Labor Costs							,									
		COSIS						:										251,700 Included
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																w\Equipment Costs Included
	Special Tools	Included w\Equipment Costs															1	w\Equipment Costs
		At 0.5% of Equipment/Material																
	Consumables	Cost At 4.5% of Equipment/Material			:													11,000
	Freight To Site	Cost											l		<u>l</u>			99,100

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	- 110						ill Creek Uni										Project No.:	
	k Lundy <sup>LLC</sup>				ļ												<del> </del>	
hicag	go				ļ		Mitigation Sy		-								<del> </del>	12/20/2005
							า 1 - Hydrate										Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate			~						Run Date:	1/27/2006
				-		-C	ONFIDENTIA	\L-	Wage Rates	Based on:			Louisville	, KY			Preparer:	
									Labor Produ	ctivity =			1				Reviewer:	:
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (install)	Total Projected Cos
	Taxes - Sales/Use/VAT/Business/Etc.				<b> </b>							1						Not Included
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
											12,606			968,806				0.000.50
	SUBTOTAL INSTALLED COST				<u> </u>			***************************************	ļ	U	12,000			900,000				3,689,50
	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team								0								368,95
	ING, MODELING, ETC.				<b> </b>					0								50.00
STARTUF	P, TESTING AND REAGENT (15 DAYS)									0								50,00
CONTING		At 20% of Total	ļ	ļ	<u> </u>					0				-				821,70 100,00
	NTERNAL COST	Furnished by Owner			<u> </u>					0								
SPARE PA					<b></b>													Not Included
ESCALAT		Not Included	ļ	<b>_</b>	<u> </u>													
INTERES	T DURING CONSTRUCTION (AFUDC)	Not Included			<u> </u>					******								
			•	1	1					1								5,030,15

				T		Louis	ville Gas & E	lectric						T			stimate No.:	21985B
Sargent 8	د Lundy <sup>LLC</sup>						ill Creek Uni										Project No.:	
Chica							Mitigation Sy										Date	12/20/2005
							Magnesium										Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co										Run Date:	1/27/2006
							ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY		,	Preparer	:
									Labor Produ	ctivity =			1				Reviewer	
ltem No.	<u>Description</u>	Scope Definition	Cost Type	<u>Quantity</u>	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	Total Projected Cos
-	DUCTWORK MODIFICATIONS																	
	MODIFY GAS DUCT TO ACCEPT INJECTION																	
DW-1	NOZZLES DUCTWORK MODS		Est	1	TN	2,625.00	2,625		35.00	35	35	FLDU	89.66	3,138				5,80
	INSULATION & LAGGING	6" THICK INSULATION	Est	200	SF	21.00			0.27	54	54	DINS	59.32	3,203				7,40
DW-4	DUCTWORK SUPPORT STRUCTURES			5	TAI	1,890.00	9,450		16.00	80		STST	86.46	6,917			<b></b>	10.40
	STRUCTURAL STEEL ACCESS & GALLERIES		Est Est	400	TN SF	31.50		3	0.40	160	160	GALL	71.2					16,40 24,00
	ACCESS & GALLET HEC			7,00		7,.50	.2,000	-	1					71,002				27,00
DW-6	BOILER MODS															**************************************		
	WALL AND TUBE MODS		Est	2	TN	2,625.00	5,250		35.00	70	70	FLDU	89.66	6,276				11,50
<u> </u>	DUCTWORK SUBTOTAL						34,125				399			30,926				65,10
	Injection System																	
IS-1	EQUIPMENT/COMPONENTS																	
	Air Blowers	15 hp each	Est	3	EA	21,000.00	63,000		40.00	120		MECH	66.86					71,00
	VFD Rotary Feeder	3 hp -Stainless steel	Est	1	EA	10,500.00	10,500		30.00	30	30	MECH	66.86	2,006				12,50
	Long-Term Storage Tank - Common for 2 Units (10 Days), Unit cost is split between Units 3 and 4	1,617,900 lb full - 17,060 ft3 - D=26.3' - H=31.6' - CS	Est	1	EA	151,000.00	151,000		580.00	580	580	TANK	65.78	38,152				189,20
	Short-Term Storage Silo - (24 Hours)	Not required	Est	0	EA	10,500.00			60.00	0	0	TANK	65.78					50.70
	Air Compressors (2 Qty)	50 hp - 2 X 100% 808,320 lb full - 8,520 ft3 -	Est	2	EA	21,000.00	42,000	-	80.00	160	160	MECH	66.86	10,698				52,70
A .	Mixing Tank - 1 Unit - (24 Hours)	D=20.8' - H=25.0'	Est	1	EA	63,000.00			880.00	880		TANK	65.78					120,90
	Mixing Tank Agitator (1 Qty)	20 hp - CS Shaft	Est	2	EA	21,000.00			30.00	60		MECH	66.86					46,00
	Mater Stevens Tools 4 Hait (04 Has)	125,000 lb full - 2,000 ft3 - D=13.7' - H=13.7' - CS	Ect	.	EA	46,000.00	46,000		880.00	880	ρρη	TANK	65.78	57,886				103,90
	Water Storage Tank - 1 Unit (24 Hrs) Slurry/Water Pumps (6 Qty)	D=13./' - H=13./' - CS 2 hp - CS	Est Est	6	EA	5,250.00			20.00	120		PUMP	65.83					103,90 39,40
	Injection Manifold (2 Qty)	Stainless Steel	Est	2	EA	10,500.00	21,000		240.00	480	480	MECH	66.86	32,093				53,10
	Dual Fluid Injection Nozzles (20 Qty)	Stainless Steel	Est	1	LT	42,000.00	42,000		96.00	96	96	MECH	66.86	6,419				48,40
	System Piping				<b> </b>		000			40		CDNO	70.4	0.404				
	1" - CS	Includes fitting allowance	Est	300	LF	2.27			0.16 0.33	49		SPNG SPNG	70.4 70.4	3,464				4,10
	4" - CS	Includes fitting allowance	Est Est	50 350	LF LF	9.28 2.99			0.33	17 26		INSUL	70.4 53.39	1,162 1,402				1,60 2,40
	Piping Insulation & Lagging Heat Tracing		Est	350	LF	21.00			0.00	109		WIRE	69.06	7,493				14,80
	Valves	Allowance	Est	1	LS	1,050.00			24.75	25		SPNG	70.4	1,742				2,80
	Supply Piping	Allamana	F-4	200	<u> </u>	940.00	160,000		100.00	20,000	20,000	SDNG	70.4	1,408,000				1 576 00
-	Water Supply	Allowance	Est	200	LS	840.00 525.00			80.00	20,000 16,000	20,000 16,000		70.4 70.4	1,408,000 1,126,400				1,576,00
	Air Supply	Allowance Allowance	Est Est	200	LS LS	2,100.00			40.00	16,000			70.4	1,126,400 2,816				1,231,40 4,90
_	Piping Supports Piping Rack	Allowance	Est	10	TN	2,200.00			16.00	160		STST	86.46	13,834				35,80
 IS-2	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	110	CY	157.50	17,325		7.00	770	770	CONP	52.91	40,741				58,10
IS-3	STRUCTURAL STEEL		Est	10	TN	2,200.00			16.00	160	160	STST	86.46					35,80
							L		11									. <u> </u>

						Louis	ville Gas & E	lectric		T						1	stimate No.:	21985B
Sargent 8	k Lundy <sup>LLC</sup>						ill Creek Uni			<del> </del>							Project No.:	10584-022
Chica							Mitigation Sy										<u> </u>	12/20/2005
) Villea	go						Magnesium											1/27/2006
	O TE PLEN EN PLANTE						agnitude Co		1.						-		+	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote		<b></b>	ļ.	ļ		ONFIDENTIA		Wage Rates	Posed on:			Louisville	VV			Preparer:	
			-			<u> </u>	UNFIDENTIA	<b>1</b>	Labor Produ	~~~~			Louisville	, K1		<b> </b>	Reviewer:	
									Labor Frodu	Cuvity =							neviewei.	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cost</u>
IS-4	AUGER CAST PILES (120 TON CAPACITY)	90 ft LONG	Est	0	LF	10.00	0		0.52	0	0	PILE	82.81	0				0
10-4	ACCENTOACT FILES (120 FON CALACITY)	30 IL COING			l													
IS-5	IS SYSTEM SUBTOTAL						859,017				40,761			2,845,961				3,704,800
															<b> </b>			
	MATERIAL UNLOADING SYSTEM		<u> </u>			:											<b></b>	
	INIATERIAL UNLUADING STOTEM								<b> </b>									
ASH-1	TRUCK UNLOADING SYSTEM		Est	1	Set	105,000.00	105,000		1254.00	1,254	1,254	SPNG	70.4	88,282				193,300
									<u> </u>									100.000
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL		ļ				105,000				1,254			88,282			ļ	193,300
1,700	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE	in a second control of the second control of	<u> </u>															
	1 CWEN GOONGE	Double Ended Unit Substation with (2) 1 MVA,	-															
-	SWITCHGEAR	6.9-480V XFMR's	Est	11	EA	460,000.00			500.00 100.00	500 100	500 100		53.92	26,960				487,000 63,000
	New Breaker at Existing 13.2kV Switchgear		Est Est	1 2	EA EA	63,000.00 42,000.00		Management was a second of the second	200.00	400	400		53.92	21,568				105,600
	MCC Misc Electrical Equipment & Controls		Est	1 1	LS	8,400.00			300.00	300	300		53.92	16,176				24,600
	Misc Electrical Equipment & Controls										0							
AP-2	GROUNDING										0							
	Cable - 500kcmil GND		Est	2,000	LF	2.10			0.05	100 48			69.06	6,906			<b></b>	11,100
2.87	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,400
ADO	CABLE		ļ															
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60	0	Routed in 5" Conduit	0.69	0	0	WIRE	69.06	0				0
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.70	3,675	Routed in 3" Conduit	0.69	173		WIRE						
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.40		Routed in 2" Conduit	0.35	0	0	WIRE						
					١.,-		1	Routed in 1-1/2" Conduit	0.50			WIRE	69.06	0				
<b> </b>	Power Cables from Switchgear to TR Sets Power Cables from MCC to Loads - 1 ~ 5HP	3/C #2/0, 600V 3/C #10, 600V	Est Est	300	LF LF	6.30 0.76	227	Routed in 3/4" Conduit	0.52 0.05	16	16	WIRE	69.06	1,098			<b>-</b>	1 300
	Power Cables from MCC to Loads - 1 ~ 5HP  Power Cables from MCC to Loads - 15HP	3/C #10, 600V	Est	150	LF	1.58	236	Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549				1,300 800
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	0	LF	2.12	0	Routed in 1-1/2" Conduit	0.09	0	0	WIRE						
		0/0 // 000/	F	100	LF	2.67		Routed in 1-1/2" Conduit	0.35	25	25	WIRE						
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V 3/C #2, 600V	Est Est	100 50	LF LF	3.58	179	Routed in 2" Conduit	0.35	18	18	WIRE	69.06	1,209				1,400
	Power Cables from MCC to Loads - 60HP Control Cables - Pumps	5/C #14, 600V	Est	300	LF	0.67	202	Routed in 3/4" Conduit	0.03	10	10		69.06	663				1,400 900
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81	0	Routed in 1-1/2" Conduit	0.04	0	0	WIRE	69.06					0
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25	189	Routed in 3/4" Conduit	0.03	24 32	24		69.06	1,657				1,800
	Data Highway Cable		Est	1,000	LF	3.15	3,150	Routed in 3/4" Conduit	0.03	32	32	WIRE						
AP-4	RACEWAY		<b>.</b>															
	3/4" Conduit		Est	2,500	LF	2.06			0.19	485	485	ECND						
	1-1/2" Conduit		Est	100	LF	4.67			0.28	28		ECND						
-	2" Conduit		Est Est	50 250	LF LF	6.25 13.13			0.35 0.65	18 161		ECND ECND						
	3" Conduit 5" Conduit		Est	250	LF LF	38.33			1.13	. 101		ECND				***************************************		
	o Conduit				-	00.00					Ö		0					
AP-5	DCS SYSTEM ADDITIONS										. 0							

П						Louis	ville Gas & E	lectric				1			1:	ŀ	Estimate No	.: 21985B
Sargent &	Lundy <sup>LLC</sup>						ill Creek Unit										Project No	o.: 10584-022
^hicag						SO3	Mitigation Sy	rstem					ļ					e: 12/20/2005
			-				Magnesium					ļ						1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co		Wage Rates	Based on:	<u> </u>		Louisville	l KV			Prepare	e: 1/27/2006
							ONFIDENTIA	\L-	Labor Produ				Louisville	;, K1	<u> </u>		Reviewe	
1																		
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
	Oaklinah		Est	-	EA	31,500.00	31,500		40.00	40	Δ(	EHEA	1					
1	Cabinets		ESI	,	EA	31,300.00	31,500		40.00	40	(						1	
	DCS PROGRAMMING/INTERFACE		Est	1	EA	2,625.00	2,625		20.00	) 20	20	EHEC		:	<u> </u>			
	Interface Hardware Programming /Interface		Est	1	LT	5,250.00	5,250		0.00	0	(	WIRE	69.06	S C				5,30
			Est	1	LT	10,500.00	10,500		100.00	100	100	INEL						
AP-9	LIGHTING ALLOWANCE		ESI	-		10,500.00	10,000		100.00	100	100	11166						
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL					3	689,199				2,615			80,761				709,20
	REINFORCING OF EXISTING EQUIPMENT	NONE						,										
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE																
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	5,250.00	5,250		1550.00	1,550	1,550	PNTR	55.58	86,149				91,40
MISC-2	ROADWORK	Not Required	Est	0	LS	36,750.00	0		380.00	0	0	PBIT	62.43	0				
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,90
MISC-4	OTHER							·										
	PUMP HOUSE 15' X 20'																	
		INCLUDES EXCAVATION & BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,20
	PREFAB BLDG.		Est	1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,20
MISC-5	CFD MODEL STUDY		Est	1	LS	100,000.00	100,000		40.00	40	40	STST	86.46	3,458				103,500
MISC-6	TANK BERM		Est	1	LS	65,000.00	65,000		260.00	260	260	STST	86.46	22,480				87,500
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	25,000.00	25,000		60.00	60	60	STST	86.46	5,188				30,200
MISC-5	MISC. SUBTOTAL						54,538				2,155			122,239				176,700
		· · · · · · · · · · · · · · · · · · ·											:					
	GENERAL SUPPORT									-								
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
Ge-5	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,000
	SUBTOTAL						1,931,879			0	47,544			3,299,294				5,170,300
	Craft Support During Startup Allowance for Premium Time Labor	At 3% of Total Manhours		7						4	1,426	MECH	66.86	95,364				95,400 Not Included

					1	Louis	ville Gas & E	lectric								E	Estimate No.:	21985B
Sargent &	Lundy <sup>LLC</sup>					M	ill Creek Uni	t 3									Project No.:	10584-022
`ica	no					SO3	Mitigation Sy	/stem								_	Date:	12/20/2005
				1			Magnesium										Rev Date	1/27/2006
	Ocal Town Est Salimeted Bird Monday guale			+	-		agnitude Co		1				-		<u> </u>		Run Date:	1/27/2006
·	Cost Type: Est = Estimated, Bid = Vendor quote			ļ	-		ONFIDENTIA		Wage Rates	Bacad on:			Louisville	KV			Preparer:	
					-		ONFIDENTIA	<b>1</b>	Labor Produ				LOUISVIIIC	, K1			Reviewer:	
									Labor Produ	ictivity =						, .	neviewei.	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
																		No. 1 to all all all
	Productivity Loss Due To Overtime																	Not Included
	Per Diem Expense				ļ													Not Included Not Included
	Project Wrap (Efficacy) Insurance			ļ								<u> </u>						Not included
	Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs																258,50
1.	Erection Contractor's Profit	At 8% of Material and Labor Costs																413,60
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																Included w\Equipment Costs Included
																		w\Equipment
	Special Tools	Included w\Equipment Costs At 0.5% of																Costs
	Consumables	Equipment/Material Cost At 4.5% of		ļ														9,70
	Freight To Site	Equipment/Material Cost															<u> </u>	86,90
	Taxes - Sales/Use/VAT/Business/Etc.								-									Not Included
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
	SUBTOTAL INSTALLED COST				<u> </u>					0	48,970			3,394,658				6,034,40
	OUD TO THE HOTPILLED GOOT			1														
ENGINEE	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team								0				:				603,40
PERMITT	ING, MODELING, ETC.									0							<b></b> '	F2 22
STARTUF	P, TESTING AND REAGENT (15 DAYS)									0			-					50,00
CONTING	SENCY	At 20% of Total								0						~~~~		1,337,60
	NTERNAL COST	To Be Furnished by Owner								0							<b> </b>	100,00 Not Included
SPARE P									ļ	0							<b> </b>	NOT ITICIUded
<b>ESCALAT</b>	TION	Not Included															<b> </b>	<b></b>
INTERES	T DURING CONSTRUCTION (AFUDC)	Not Included			<u> </u>													
	PROJECT TOTAL :			1	1					. 0								8,125,40

						Louis	ville Gas & E	lectric					B/	T			stimate No.	21986B
Sargent 8	& Lundy <sup>LLC</sup>		<u> </u>				lill Creek Uni			_		-	<u></u>				Project No.	-
Chica							Mitigation Sy			-	[		8 <u></u>				<del> </del>	12/20/2005
							tion 3 - Soda						7.				Rev Date	1/27/2006
<u> </u>	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co					-2000	*				Run Date	1/27/2006
							ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer	:
									Labor Produ	uctivity =		-	1				Reviewer	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> <u>Equipment or</u> <u>Material Cost</u>	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	Total Projected Co
	DUCTWORK MODIFICATIONS									-								
											·			-				
	MODIFY GAS DUCT TO ACCEPT INJECTION NOZZLES								1									
DW-1	DUCTWORK MODS		Est	1	TN	2,625.00	2,625		35.00	) 35	35	FLDU	89.66	3,138				5,80
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40			0.27		54		59.32					4,90
										]								1
DW-4	DUCTWORK SUPPORT STRUCTURES STRUCTURAL STEEL				7-41	4 000 00	0.450		1000									
	ACCESS & GALLERIES		Est Est	5 400	TN SF	1,890.00 31.50			16.00 0.40			STST GALL	86.46 71.2				-	16,40
	AGGEOGRA GALLETIEG		LOI	700		31.50	12,000		0.40	1	100	UALL	'1.2	11,392				24,00
DW-9	DUCTWORK SUBTOTAL						26,355				329			24,650				51,10
	Injection System																	
,	FOLUDATAIT/COMPONENTS				<u> </u>				ļ									
l —	EQUIPMENT/COMPONENTS Process Technology Package (PTP) by URS		Est	1	EA	1,800,000.00	1,800,000		300.00	300	300	PUMP	65.83	19,749				1,819,70
	Pumps (6 Qty)	4 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP	Est	6	EA	2,100.00			20.00			PUMP	65.83					
	Long-Term Storage Silo - Common for 2 Units (10		LSI		<u> </u>	2,100.00	12,000		20.00	120	120	r Olvir	05.65	7,900				20,50
	Days), Unit cost is split between Units 3 and 4	D=17.6' - H=21.2' - SS	Est	1	EA	151,000.00	151,000		535.21	535	535	TANK	65.78	35,206				186,20
		309,312 lb full - 4,957 ft <sup>3</sup> -			_,	00.075.00	00.075		400 50	l	400							
	Soft H₂O Storage Tank - 1 Unit - (24 Hours) Agitator (1 Qty)	D=18.48' - H=18.48' - CS SS Shaft - 20 HP	Est Est	1 1	EA EA	39,375.00 21,000.00	39,375 21,000		489.52 30.00	490 30	490	TANK MECH	65.78 66.86	32,201 2,006				71,60
	Agricult (1 Qty) Air Compressors (2 Qty)	2 x 100% - 50 HP	Est	2	EA	21,000.00			80.00	160	160	MECH	66.86	10,698				23,00 52,70
	Injection Manifold (2 Qty)	Stainless Steel	Est	2	EA	10,500.00	21,000		240.00	480	480	MECH MECH	66.86 66.86	32,093				53,10
	Dual Fluid Injection Nozzles (100 Qty)	Stainless Steel	Est	1	LT	21,000.00	21,000		480.00	480	480	MECH	66.86	32,093				53,10
	System Piping	L=250' - D=4" - SS / L=50' - D=4" - CS / L=50' - D=2" - SS														•		
	6" - SS	Includes fitting allowance	Est	250	LF	30.61			0.42	105		SPNG	70.4	7,392				15,00
	6" - CS	Includes fitting allowance	Est	50	LF	11.89			0.42	21		SPNG	70.4	1,478				2,10
	4" - SS Piping Insulation & Lagging	Includes fitting allowance	Est Est	50 350	LF LF	24.89 9.14	1,244 3,197		0.33 0.17	17 60		SPNG INSUL	70.4 53.39	1,162 3,177				2,40
	Heat Tracing		Est	350	LF LF	21.00			0.17	109	109	WIRE	69.06	7,493				6,40 14,80
	Valves	Allowance	Est	1	LS	2,520.00			48.00	48		SPNG	70.4	3,379				5,90
	Supply Piping																	3,50
	Water Supply	Allowance	Est	1	LS	840.00			100.00	100		SPNG	70.4	7,040				7,90
	Air Supply	Allowance	Est	1: 1:	LS	525.00			80.00	80	80		70.4	5,632				6,200
	Piping Supports Piping Rack	Allowance Allowance	Est Est	10	LS TN	2,940.00 2,200.00			112.00 16.00	112 160	112	SPNG STST	70.4 86.46	7,885 13,834				10,800 35,800
I	т іріпу паск	INCLUDES EXCAVATION &	LOL	10	111	2,200.00	22,000		10.00	100	100	U101	00.40	10,604				35,800
IS-2	FOUNDATIONS	BACKFILL	Est	75	CY	157.50			7.00	525	525	CONP	52.91	27,778				39,60
	STRUCTURAL STEEL		Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,80
ī.	AUGER CAST PILES (125 TON CAPACITY)	100 ft LONG	Est	0	LF	10.00	0		0.52	0	0	PILE	82.81	0				1
IS-3	ROYALTY FEE	0	Est	0	LF		8							0				

<b></b>			T			Louis	ville Gas & E	Electric	1		\$						stimate No.:	21986B
Sargent &	& Lundy <sup>LLC</sup>						lill Creek Uni			_							Project No.:	10584-022
Chica					1		Mitigation S		1			-					Date	12/20/2005
- 111100					-		tion 3 - Soda				>		\$				Rev Date	1/27/2006
<b>-</b>	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co		-	-	\ <u></u>	-200	<u> </u>				ļ	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote		ļ		ļ				Wage Rates		8	2552 MAY 2554	() ()	LVV	<b>-</b>			<del> </del>
			ļ		ļ		ONFIDENTIA	AL-		_20000000000000000000000000000000000000			Louisville	, KY	ļ		Preparer	ļ
		<u> </u>	ļ						Labor Produ	ictivity =	k.		() ()				Reviewer	
										N. Santille Santille	Z- S							
Item No.	Description	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> Equipment or Material Cost		Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
IS-4	IS SYSTEM SUBTOTAL						2,190,650				4,090			272,027			:	2,462,60
	MATERIAL UNLOADING SYSTEM		<u> </u>		<u> </u>				ļ	1					<u> </u>	ļ		
AOUL	TOLON LINE CADING SYSTEM			<b></b>		105 000 00	105.000		1054.00	1 , , , ,	1051	CDNIC	<u></u>	00.000		ļ	ļ	100.00
ASH-1	TRUCK UNLOADING SYSTEM		Est	1 1	Set	105,000.00	105,000		1254.00	1,254	1,254	SPNG	70.4	88,282				193,30
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL		<del> </del>	<b> </b>			105,000		<b> </b>	1	1,254		<b></b>	88,282	<u> </u>			193,30
	MAN EINAE ONEOADING OTOTEM GODTOTAL		1				1		T	1	,,254			30,202				1
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE			1														
	SWITCHGEAR  New Breaker at Existing 13.2kV Switchgear  MCC  Misc Electrical Equipment & Controls	Double Ended Unit Substation with (2) 1MVA, 6.9-480V XFMR's	Est Est Est Est	1 1 2 1	EA EA EA LS	460,000.00 63,000.00 42,000.00 8,400.00	63,000		500.00 100.00 200.00 300.00	100 400	100 400		53.92 53.92 53.92 53.92	26,960 5,392 21,568 16,176	,			487,000 68,400 105,600 24,600
	GROUNDING															,		
	Cable - 500kcmil GND		Est	2,000	LF	2.10			0.05	100		WIRE	69.06	6,906				11,100
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,400
AP-3	CABLE		<u> </u>	<b> </b>	<b> </b>									<u> </u>				
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60	0	Routed in 5" Conduit	0.69	0	0	WIRE	69.06	0				
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.70	3,675	Routed in 3" Conduit	0.69	173	173	WIRE	69.06	11,913				15,600
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.40	0	Routed in 2" Conduit	0.35	0	0	WIRE	69.06	0				(
								Routed in 1-1/2"										
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30		Conduit	0.52	0		WIRE						(
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	200	LF LF	0.76 1.58		Routed in 3/4" Conduit Routed in 3/4" Conduit	0.05 0.05	11	11	WIRE WIRE	69.06 69.06	732			` ;	900
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	L.C	1.58		Routed in 1-1/2"	0.05	Ų	0	**IFIE	09.00					
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	50	LF	2.12		Conduit	0.09	5	5	WIRE	69.06	311				400
	- 0.15. Gabios nom Woo to Edado - 20 - 00 fil	1.0.0,000,						Routed in 1-1/2"										
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V	Est	100	LF	2.67		Conduit	0.35	35	35	WIRE	69.06	2,417		;		2,700
	Power Cables from MCC to Loads - 60HP	3/C #2, 600V	Est	0	LF	3.58		Routed in 2" Conduit	0.35	0	0	WIRE	69.06	0				(
	Control Cables - Pumps	5/C #14, 600V	Est	175	LF	0.67		Routed in 3/4" Conduit Routed in 1-1/2"	0.03	6	6	WIRE	69.06	387				500
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81		Conduit	0.04	n	٨	WIRE	69.06	n				
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.81		Routed in 3/4" Conduit	0.04 0.03	24		WIRE	69.06	1,657				1,800
	Data Highway Cable		Est	1,000	ĹF	3.15		Routed in 3/4" Conduit	0.03		32	WIRE	69.06	2,210				5,400
AP-4	RACEWAY																	
	3/4" Conduit		Est	2,125	LF	2.06	4,373		0.19	412	412	ECND	49.67	20,477				24,800
	1-1/2" Conduit		Est	150	LF	4.67	701		0.28	43	43	ECND	49.67	2,116				2,800
	2" Conduit		Est	0	LF	6.25			0.35	_0	0	ECND	49.67	0				(
	3" Conduit		Est	250	LF	13.13			0.65	161		ECND	49.67	8,009				11,300
<u> </u>	5" Conduit		Est	0	LF	38.33	0		1.13	U	0	ECND	49.67			***************************************		t
<u>,</u>	DCS SYSTEM ADDITIONS	- <del>1</del> 2	<b> </b>	1	<b></b>													
	Cabinets	<u> </u>	Est	1	EA	31,500.00	31,500	2	40.00	40	40	EHEA	53.92	2,157				33,700
	<u> </u>		1			1					*							
4P-8	DCS PROGRAMMING/INTERFACE			- 12 <u>- 12 </u>		<u> </u>												

<u></u>						Louis	ville Gas & E	lectric								E	Estimate No.:	21986B
Sargent	& Lundy <sup>LLC</sup>				-	4	ill Creek Uni			-		-					Project No.:	
Chica	go						Mitigation Sy					-	!					12/20/2005
							tion 3 - Soda			-			<u> </u>				Rev Date	1/27/2006
[	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	lagnitude Co	st Estimate									Run Date:	1/27/2006
						-C	ONFIDENTIA	AL-	Wage Rates	_HSSSHX94968656			Louisville	, KY			Preparer:	
					-	ļ			Labor Produ	ictivity =			1				Reviewer:	
											\$ }	l						
Item No.	Description	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
	Interfere Headure		Est			2 625 00	2.625		20.00			FUE	50.00	4 407	-			0.000
	Interface Hardware Programming /Interface		Est Est	1	EA LT	2,625.00 5,250.00			20.00	2	20	EHEC WIRE	59.36 69.06					3,800 5,300
AP-9	LIGHTING ALLOWANCE		Est	11	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003	-			24,800
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						693,130				2,558			143,552				836,900
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE							·									
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,675.00	3,675		1250.00	1,250	1,250	PNTR	55.58	69,475				73,200
1 2	ROADWORK		Est	0	LS	36,750.00	0		380.00	(	0	PBIT	62.43	0				C
						7.050.00	7.050		200 00									
MISC-3	STORM DRAINAGE		Est	1 1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4	OTHER																	
	PUMP HOUSE 15' X 20'							·			1							
	FUMP HOUSE 13 A 20	INCLUDES EXCAVATION &																
IS-2	FOUNDATIONS	BACKFILL	Est	25	CY	157.50	3,938		7.00	178	175	CONP	52.91	9,259				13,200
	PREFAB BLDG.		Est	1 1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,200
MISC-5	MISC. SUBTOTAL				<u> </u>		52,963	<u> </u>			1,855			105,565				158,500
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
			LUI	1	b-1		· ·											
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,000
	SUBTOTAL		·		<b>1</b>		3,068,098			C	10,087			734,076				3,802,400
																		0
	Craft Support During Startup Allowance for Premium Time Labor	At 3% of Total Manhours			<u> </u>						303	MECH	66.86	20,232		-		20,200 Not Included
	Productivity Loss Due To Overtime																	Not Included
	Per Diem Expense																	Not Included
	Project Wrap (Efficacy) Insurance Erection Contractor's General & Administrative	At 5% of Material and Labor		<b> </b>														Not Included
	Costs	Costs																190,100
	Erection Contractor's Profit	At 8% of Material and Labor																
		Costs	·												<u> </u>			304,200 Included
)															<b>l</b>			w\Equipment
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs	<u> </u>	<u> </u>	<u> </u>	<u> </u>			L								1	Costs

						Louis	ville Gas & E	lectric				Y.				E	Estimate No.:	21986B
Sargent 8	k Lundy <sup>LLC</sup>					M	ill Creek Uni	t 3									Project No.:	10584-022
Chica						SO3	Mitigation Sy	/stem									Date:	12/20/2005
	X						ion 3 - Soda										Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote			<del> </del>			agnitude Co		<del>                                     </del>								Run Date:	
	Cost Type: Est = Estimated, Bid = Vendor quote			-					Wage Rates	A	<u> </u>		Louisville	LV				172172000
					ļ		ONFIDENTIA	\L- 			\$ 		Louisville	, KT			Preparer:	
									Labor Produ	ctivity =			) 1 }				Reviewer:	
							<u>Total</u>		Unit Man-	<u>Total</u>	Total Man-		Crow	Total	Sub-			
<u>Item No.</u>	<u>Description</u>	Scope Definition	<u>Cost</u> <u>Type</u>	<u>Quantity</u>	Unit of Measure	Unit Equip./ Mat. Cost	Equipment or Material Cost	Cost Development	hours (Base)	Total Man- hours (Base)	hours, Prod	Crew Code	Crew Wage Rate	Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
																		Included w\Equipment
	Special Tools	Included w\Equipment Costs																Costs
		At 0.5% of																
	Consumables	Equipment/Material Cost																15,30
		At 4.5% of												e e e e e			1 /	
	Freight To Site	Equipment/Material Cost																138,10
	Taxes - Sales/Use/VAT/Business/Etc.								ļ								<b></b>	Not Included
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner									,							By Owner
	SUBTOTAL INSTALLED COST									0	10,389			754,308				4,470,30
ENGINEE	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team						•		0							<u> </u>	447,00
PERMITT	ING, MODELING, ETC.									0							<u> </u>	
STARTU	P, TESTING AND REAGENT (15 DAYS)									0							<b></b> '	50,00
CONTING		At 20% of Total								0							<b></b> '	993,50
<u>۱۱ ۲۷ </u>	NTERNAL COST	Furnished by Owner		<u> </u>					ļ	0								100,00
	ARTS			<u> </u>						0							ļ	Not Included
ESUALAT	TION	Not Included			-												1	<b></b>
INTERES	T DURING CONSTRUCTION (AFUDC)	Not Included		ļ	<b></b>													
	DDO IFOT TOTAL								ļ	n							-	6,060,80
	PROJECT TOTAL :				1	1	1		1 1		4		1		1	l	1	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

				-		Louis	ville Gas & E	lectric									stimate No.:	: 21987B
Sargent 8	& Lundy LLC			1		M	ill Creek Uni	t 3									Project No.:	: 10584-022
Chica						SO3	Mitigation Sy	ystem									Date	: 12/20/2005
						Option 4 -	Sodium Bisi	ulfite (SBS)									Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate									Run Date:	: 1/27/2006
						-C	ONFIDENTIA	AL-	Wage Rates	Based on:			Louisville	e, KY			Preparer:	:
									Labor Produ	ıctivity =			1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
	DUCTWORK MODIFICATIONS																	
					ļ				_									
DW 4	MODIFY GAS DUCT TO ACCEPT INJECTION						ŀ					ľ		j.			ľ	
DW-1	NOZZLES DUCTWORK MODS		Est	1	TN	2,625.00	2,625		35.00	35	35	FLDU	89.66	3,138				5,80
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40	1,680		0.27	54		DINS	59.32					4,90
																		.,,,,
DW-4	DUCTWORK SUPPORT STRUCTURES		F-:	<u> </u>	781	1 000 00			1.000	ļ <u>-</u> -		CTCT	00.15					
	STRUCTURAL STEEL ACCESS & GALLERIES		Est Est	5 400	TN SF	1,890.00 31.50	9,450 12,600		16.00 0.40	80 160		STST GALL	86.46 71.2	6,917 11,392				16,40
	ACCESS & GALLENIES		Lol	700		51.50	12,000		0.40	100	100	UNLL	1.2	11,392				24,000
							00.055											
DW-9	DUCTWORK SUBTOTAL						26,355				329			24,650				51,10
	Injection System						-											
		A STATE OF THE STA						**************************************										
<u> </u>	EQUIPMENT/COMPONENTS				1			i.	<b></b>	~	-							
	Process Technology Package (PTP). The cost shown here is for a single skid shared by Unit 3 and 4.	P&ID, Control Logic, Injection and metering pump skids, Proprietory injection lances 4 - CS internals - 2.0 HP / 4 -	Budget	1	EA	1,800,000.00	1,800,000		200.00	200	200	PUMP	65.83	13,166				1,213,200
	Pumps (6 Qty)	SS internals - 1.0 HP	Est	6	EA	2,100.00	12,600		20.00	120	120	PUMP	65.83	7,900				20,50
	Long-Term Storage Silo - Common for 2 Units (10 Days), Unit cost is split between Units 3 and 4	D=16.2' - H=20.0' - SS	Est	1	EA	605,000.00	605,000		1064.00	1,064	1,064	TANK	65.78	69,990				675,00
	Soft H₂O Storage Tank - 1 Unit - (24 Hours)	Included in Soft water Supply System	Est	0	FA	0.00	0		0.00	0	0	TANK	65.78	0				
	Agitator (1 Qty)	SS Shaft - 20 HP	Est	0	EA	21,000.00			0.00	ŏ	Ö	MECH	66.86	0				
	Air Compressors (2 Qty)	2 x 100% - 150 HP	Est	3	EA	275,000.00	825,000		80.00	240	240	MECH	66.86	16,046				841,000
	Injection Manifold (2 Qty)	Stainless Steel	Est	0	EA	10,500.00 21,000.00			0.00	0	0	MECH MECH	66.86 66.86	0				
	Dual Fluid Injection Nozzles (100 Qty)	Stainless Steel  L=250' - D=4" - SS / L=50' -	Est	0	LT	21,000.00	U		0.00	U	U	MECH	00.80					
<b></b>	System Piping 6" - SS	D=4" - CS / L=50' - D=2" - SS Includes fitting allowance	Est	250	LF	30.61	7,652		0.42	105	105	SPNG	70.4	7,392				15,000
	6" - CS	Includes fitting allowance	Est	50	LF	11.89			0.42	21		SPNG	70.4	1,478				2,100
	4" - SS	Includes fitting allowance	Est	50	LF	24.89			0.33	17	17		70.4	1,162				2,100
	Piping Insulation & Lagging		Est	350	LF	9.14	3,197		0.17	60	60	INSUL	53.39	3,177				6,400
	Heat Tracing		Est	350	LF	21.00	7,350		0.31	109	109	WIRE	69.06	7,493				14,800
	Valves	Allowance	Est	11	LS	2,520.00	2,520		48.00	48	48	SPNG	70.4	3,379				5,900
	Supply Piping	All	F	<b> </b>	1.0	040.00	040		100.00	- 400		CDNO	70 (	7.7.				
	Water Supply	Allowance	Est	1	LS LS	840.00 525.00			100.00 80.00	100 80	100 80	SPNG SPNG	70.4 70.4	7,040 5,632				7,900
	Air Supply Piping Supports	Allowance Allowance	Est Est	1 1	LS	2,940.00			112.00	112		SPNG	70.4 70.4	7,885				6,200 10,800
	Piping Supports Piping Rack	Allowance	Est	10	TN	2,200.00			16.00	160	160	STST	86.46	13,834				35,800
le .	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	90	CY	157.50	14,175		7.00	630		CONP	52.91	33,333				47,500
 lb-u	STRUCTURAL STEEL	Allowance	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
IS-3	AUGER CAST PILES (125 TON CAPACITY)	100 ft LONG	Est	2,200	LF	10.00	22,000		0.52	1,144	1 14/	PILE	82.81	94,735	·		·	116,700
10-0	AGGER GAST FILES (123 TON CAPACITY)	TOUR LONG	LOL	۵,200	<del>                                     </del>	10.00	22,000		5.52	1,177	1,174	- '	JE.01	34,700				110,700

				1		Louis	ville Gas & E	lectric	T	Transition of the state of the			T			T E	stimate No.	: 21987B
Sargent 8	և Lundy <sup>LLC</sup>						ill Creek Uni						<b>-</b>		<del> </del>		Project No.	: 10584-022
Chica							Mitigation Sy		-			<del>                                     </del>					<del>                                     </del>	: 12/20/2005
- 11100	go				<del>                                     </del>		Sodium Bisi			<u> </u>			-				Rev Date	<del></del>
									-	-		1	-					1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co				1	1		1222		-	<del> </del>	<del> </del>
					ļ	-(	ONFIDENTIA	<b>\L-</b>	Wage Rates			<b> </b>	Louisville	e, KY			Preparer	
					ļ				Labor Produ	ictivity =			1		<u> </u>		Reviewer	
													-					
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
IS-4	ROYALTY FEE	Not Included, \$ per MW, to be negotiated with Vendor	Est	0	LF			<u> </u>						0				
10 4	NOTALITIE	nogotiated with rende.																
IS-5	IS SYSTEM SUBTOTAL						3,349,638				4,369			307,475				3,057,00
					<b></b>				1			<u> </u>	<b></b>		·			
	MATERIAL UNLOADING SYSTEM			<u> </u>	<b></b>			:	1						<b></b>			
	TRUCK LINE OF BUILD SYSTEM				l	105 000 00	105.000		1254.00	1,254	1.054	SPNG	70.4	88,282	<b></b>	<b></b>	<b></b>	100.00
ASH-1	TRUCK UNLOADING SYSTEM		Est	1	Set	105,000.00	105,000		1254.00	1,254	1,254	SPING	/0.4	88,282	<b> </b>		<b> </b>	193,30
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL			<b>_</b>	<u> </u>	<u></u>	105,000	5			1,254			88,282				193,30
							1							·				
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE										:		<b> </b>					
	SWITCHGEAR New Breaker at Existing 13.2kV Switchgear MCC Misc Electrical Equipment & Controls	Double Ended Unit Substation with (2) 1 MVA, 6.9-480V XFMR's	Est Est Est Est	1 1 2	EA EA EA LS	460,000.00 63,000.00 42,000.00 8,400.00	460,000 63,000 84,000 8,400		500.00 100.00 200.00 300.00	500 100 400 300	100 400	EHEA	53.92 53.92 53.92 53.92	5,392 21,568				487,00 68,40 105,60 24,60
AP-2	GROUNDING			0.000	<del>  LF</del>	2.10	4,200		0.05	100	100	WIRE	69.06	6,906				11,10
	Cable - 500kcmil GND		Est Est	2,000	EA	199.50	2,394		4.00	100	48	PILE	82.81	3,975				6,40
	Grounding Rod		ESI	1 12	LA .	199.50	2,034		7.00	40	40	1166	02.01	0,570				0,40
AP-3	CABLE			1						-								
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60		Routed in 5" Conduit	0.69	0	. 0	WIRE	69.06					
	Power Cables for MCC's Power Cables for Switchgear	3/C 500kcmil, 5kV 3/C 4/0kcmil, 5kV	Est Est	250 0	LF LF	14.70 8.40	0	Routed in 3" Conduit Routed in 2" Conduit Routed in 1-1/2"	0.69 0.35	173 0	173 0	WIRE WIRE	69.06 69.06					15,600
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30	. 0	Conduit	0.52	0	o	WIRE	69.06	O				
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	200	LF	0.76	151	Routed in 3/4" Conduit	0.05	11	11	WIRE	69.06	732				900
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	LF	1.58		Routed in 3/4" Conduit	0.05	0	0	WIRE	69.06	0	·			
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	50	LF	2.12	106	Routed in 1-1/2" Conduit Routed in 1-1/2"	0.09	5	5	WIRE	69.06	311				400
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V	Est	100	LF	2.67	267	Conduit	0.35	35		WIRE	69.06	2,417			***************************************	2,70
	Power Cables from MCC to Loads - 150HP	3/C #250kcmil, 600V	Est	100	LF	1,980.00		Routed in 2" Conduit	0.35	35	35	WIRE	69.06	2,417				200,400
	Control Cables - Pumps	5/C #14, 600V	Est	175	LF	0.67		Routed in 3/4" Conduit Routed in 1-1/2"	0.03	6	6	WIRE	69.06	387				500
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81		Conduit	0.04	n	0	WIRE	69.06	0				ľ
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25	189	Routed in 3/4" Conduit	0.03	24	24	WIRE	69.06	1,657				1,800
	Data Highway Cable		Est	1,000	LF	3.15		Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210				5,400
AP-4	RACEWAY			1	<b> </b>			,										
DF-4	3/4" Conduit		Est	2,125	LF	2.06	4,373		0.19	412	412	ECND	49.67	20,477				24,800
	1-1/2" Conduit		Est	150	LF	4.67	701		0.28	43	43	ECND	49.67	2,116				2,80
	2" Conduit		Est	100	LF	6.25	625		0.35	35	35		49.67	1,748				2,400
	3" Conduit		Est	250	LF	13.13	3,281		0.65	161	161	ECND ECND	49.67 49.67	8,009				11,300
	5" Conduit	1 2 2	Est	0	LF	38.33	0		1.13	U	<u>0</u>	ECIND	49.67	. 0				0
AP-5	DCS SYSTEM ADDITIONS			<u> </u>	<b> </b>				<del>                                     </del>					· ·				

	T		:			Louis	ville Gas & E	lectric								E	stimate No.:	21987B
Sargent &	& Lundy <sup>LLC</sup>						ill Creek Uni										Project No.:	10584-022
∩hica	ago					SO3	Mitigation Sy	/stem										12/20/2005
							Sodium Bisu					ļ					<del> </del>	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote				-		agnitude Co		Wage Rates	Based on:			Louisville	LV.			Preparer:	1/27/2006
							ONTIDENTIA	<b>L</b> -	Labor Produ			<b></b>	1	, (1)			Reviewer:	<del> </del>
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR {Install)	<u>Total</u> <u>Projected Cos</u>
	Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,70
AP-8	DCS PROGRAMMING/INTERFACE Interface Hardware		Est		EA	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187				3,80
	Programming /Interface		Est	1	LT	5,250.00	5,250		0.00	0	0	WIRE	69.06					5,30
AP-9	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,80
				<u> </u>	<b> </b>													
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						891,755				2,629			147,718				1,039,70
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE																
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,675.00	3,675		1250.00	1,250	1,250	PNTR	55.58	69,475				73,200
MISC-2	ROADWORK		Est	0	LS	36,750.00	0		380.00	0	0	PBIT	62.43	0				(
	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4																		
W113U-4																		
	PUMP HOUSE 15' X 20'			<u> </u>														
	PREFAB BLDG.			1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,200
	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,200
MISC-5	CFD MODEL STUDY		Est	1	LS	0.00	0		40.00	40	40	STST	86.46	3,458				3,500
MISC-6	TANK BERM		Est	1	LS	87,000.00	87,000		260.00	260	260	STST	86.46	22,480				109,500
	SOFT WATER SUPPLY SYSTEM		Est	1	LS	27,000.00	27,000		60.00	60	60	STST	86.46	5,188			***************************************	32,200
	MISC. SUBTOTAL		A .				166,963				2,215			136,691		•		303,700
												-					· · · · · · · · · · · · · · · · · · ·	
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
GS-2	GENERAL SUPPORT SUBTOTAL		2				0				0			100,000				100,000
	SUBTOTAL						4,539,710			0	10,795			804,815				4,744,800
	Craft Support During Startup	At 3% of Total Manhours									324	MECH	66.86	21,653				21,700
	Allowance for Premium Time Labor Productivity Loss Due To Overtime						Note the second of the second						:					Not Included Not Included

						Louis	ville Gas & E	lectric									Estimate No.	.: 21987B
Sargent 8	k Lundy <sup>LLC</sup>					M	ill Creek Uni	t 3									Project No.	: 10584-022
Chica	go					SO3	Mitigation S	/stem									Date	: 12/20/2005
						Option 4 -	Sodium Bis	ulfite (SBS)									Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote		<del>                                     </del>		<u> </u>		agnitude Co		<del> </del>				<del> </del>				-	: 1/27/2006
	oost Type. Est = Estimated, Did = Vendor quote				-		ONFIDENTIA		Wage Rates	Bacad on:	1		Louisville			<u> </u>	ļ	
1			ļ	-			CINFIDEINIIA	<b>1L</b> -	Labor Produ				Louisville	, N1	<u> </u>		Preparer	
									Labor Frout	cuvity =							Reviewer	•
<u>Item No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
											-							
	Per Diem Expense									***************************************								Not Included
	Project Wrap (Efficacy) Insurance																	Not Included
	Erection Contractor's General & Administrative	At 5% of Material and Labor		ľ					1									1
	Costs	Costs																237,200
	Erection Contractor's Profit	At 8% of Material and Labor Costs									i.							379,600
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																Included w\Equipment Costs
	Special Tools	Included w\Equipment Costs														. •		Included w\Equipment Costs
	Consumables	At 0.5% of Equipment/Material Cost At 4.5% of				•:										-		22,700
	Freight To Site	Equipment/Material Cost						·								- 1		204,300
	Taxes - Sales/Use/VAT/Business/Etc.	Equipine in waterial cost			<del> </del>				1					:		***************************************		Not Included
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner									***************************************			·				By Owner
	Constituction	Talliand 2, Chile															· : · · ·	1
	SUBTOTAL INSTALLED COST									0	11,119			826,468				5,610,300
ENGINEE	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team	l		<b> </b>					0							Ī	561,000
PERMITTI	ING, MODELING, ETC.	arnished by Project Team	<b></b>	1	<b> </b>					0								301,000
	P, TESTING AND REAGENT (15 DAYS)									O								50,000
CONTING	ENCY	At 20% of Total								0								1,244,300
CLIENT IN	ITERNAL COST	Furnished by Owner								0								100,000
SPARE PA	ARTS									0								Not Included
<b>ESCALAT</b>	ION	Not Included																0
INTERES	T DURING CONSTRUCTION (AFUDC)	Not Included																0
	PROJECT TOTAL:			<b> </b>	<b>†</b>					0								7,565,600

	ι Lundy <sup>LLC</sup> go					<u> </u>					<del> </del>		+					
	go			1		M	ill Creek Uni	3									Project No.:	10584-022
						SO3	Mitigation Sy	stem									Date:	12/20/2005
						0	ption 5 - Tro	na		-							Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate									Run Date:	1/27/2006
						-C	ONFIDENTIA	\L-	Wage Rates	Based on:			Louisville	, KY			Preparer:	
									Labor Produ	ctivity =	·		1				Reviewer:	
<u>Item No.</u>	<u>Description</u>	Scope Definition	Cost Type	<u>Quantity</u>	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
	DUCTWORK MODIFICATIONS																	
	MODIFY GAS DUCT TO ACCEPT INJECTION												<u> </u>					
DW-1	NOZZLES		Est	1	TN	2,625.00	2,625		35.00	35	25	FLDU	89.66	3,138				5,80
	DUCTWORK MODS INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	2,625.00			0.27	55 54		DINS	59.32					4,90
	INSULATION & LAGGING	3 1/2 INGOL		200		<u> </u>		1			<u> </u>	-	00.02	3,200				4,50
DW-2	DUCTWORK SUPPORT STRUCTURES																	
	STRUCTURAL STEEL		Est	5	TN	1,890.00	9,450 12,600		16.00 0.40	80 160	80 160	STST GALL	86.46 71.2					16,40
	ACCESS & GALLERIES		Est	400	SF	31.50	12,600		0.40	160	160	GALL	/1.2	11,392				24,000
DW-4	DUCTWORK SUBTOTAL						26,355				329			24,650				51,100
																·····		
	Injection System		K + St															
	EQUIPMENT/COMPONENTS																	******
	Air Blowers	150 hp each	Est	6	EA	55,125.00			105.00	630		PUMP	65.83					372,200
	VFD Rotary Feeder	3 hp - Stainless Steel	Est	3	EA	10,500.00	31,500		30.00	90	90	TANK	65.78	5,920				37,400
1	Long-Term Storage Silo - Common for 2 Units (10	2,687,900 lb full - 11,610 ft <sup>3</sup> - D=20.7' - H=83.0' - CS Silo - SS																
[ ]	Days), Unit cost is split between Units 3 and 4	Hopper	Est	1	EA	590,000.00	590,000		1624.00	1,624	1,624	TANK	65.78	106,827				696,80
		268,800 lb full - 1,160 ft <sup>3</sup> -																
1	Short-Term Storage Silo - (24 Hours)	D=8.7' - H=39.0' - CS Silo - SS Hopper	Est	1	EA	180,000.00	180,000		120.00	120	120	TANK	65.78	7,894				187,900
	Injection Manifold (2 Qty)	Stainless Steel	Est	2	EA	10,500.00	21,000		240.00		480	MECH	66.86	32,093				53,100
	Injection Nozzles (50 Qty)	Stainless Steel	Est	1	LT	10,500.00	10,500		240.00	240	240	MECH	66.86	16,046				26,500
	System Piping						0.100			100	400	ODNO	70.4	44.000				
	8" - CS	Includes fitting allowance	Est	350	LF LF	18.48 6.62			0.46 0.14	160	160	SPNG INSUL	70.4 53.39	11,236				17,700
	Piping Insulation & Lagging		Est Est	0	LF LF	0.00		:	0.14	0	0	WIRE	69.06	0	<u> </u>			
	Heat Tracing Valves	Allowance	Est	1 1	LS	1,050.00			24.75	25	25	SPNG	70.4	1,742				2,800
	Supply Piping	/ HIOWALIOC	LUL	1		.,000.00	.,550							.,,				2,000
	Water Supply	Allowance	Est	0	LS	840.00			100.00	0	0	SPNG	70.4	0				
	Air Supply	Allowance	Est	0	LS	525.00			80.00	0	0	SPNG	70.4	o				
	Piping Supports	Allowance	Est	1	LS	1,575.00			60.00	60			70.4	4,224				5,800
	Piping Rack	Allowance	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
IS-2	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	90	CY	157.50	14,175		7.00	630	630	CONP	52.91	33,333				47,500
	STRUCTURAL STEEL		Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
										4 4 4 4								
IS-3	AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	2,200	LF	10.00	22,000		0.52	1,144	1,144	PILE	82.81	94,735				116,700
IS-4	IS SYSTEM SUBTOTAL						1,253,018				5,522			383,190				1,636,000
	MATERIAL UNLOADING SYSTEM				<b> </b>	<u> </u>												
f	WATERIAL UNLUADING STSTEM																	
ASH-1	TRUCK UNLOADING SYSTEM	Included in silo	Est	0	Set	105,000.00	0		1254.00	0	0	SPNG	70.4	0				0
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL				-		0				o			0		· .		0

						Louis	ville Gas & E	lectric						T		F	stimate No.:	21988B
Corgont	& Lundy <sup>LLC</sup>		-				ill Creek Uni						<u> </u>		<u> </u>		Project No.:	
Chica				<u> </u>			Mitigation Sy											12/20/2005
Cinca			-				ption 5 - Tro					<b></b>					Rev Date	
	Cost Type: Est = Estimated, Bid = Vendor quote		+				agnitude Co										Run Date:	
	Oost Type. Lot - Lottmated, Did - Vendor quote		<del> </del>	ļ	ļ		ONFIDENTIA		Wage Rates	Rased on:			Louisville	KV			Preparer:	
			-				ON IDENTIF	1L-	Labor Produ				1	1			Reviewer:	
			-														TIO TIO TIO	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
	AUXILIARY POWER SUPPLY SYSTEM/I&C				•													
AP-1	POWER SOURCE																	
		Double Ended Unit																
1	400V CWITCHOEAD	Substation with (2) 1MVA, 6.9-480V XFMR's	Est	1	EA	570,000.00	570,000		4228.49	4,228	A 000	EHEA	52.00	228,000				798,000
	480V SWITCHGEAR New Breaker at Existing 4160V Switchgear	6.9-480V XFMH'S	Est	-	EA	63,000.00	63,000		100.00	100	4,228 100	EHEA	53.92 53.92	5,392				68,400
<b> </b>	MCC		Est	2	EA	42,000.00	84,000		200.00	400	400	EHEA	53.92	21,568				105,600
	Misc Electrical Equipment & Controls		Est	1	LS	60,900.00	60,900		1418.55	1,419	1,419		53.92					137,400
AP-2	GROUNDING		<b>I</b>															
<del></del>	Cable - 500kcmil GND		Est	2,000	LF	2.10			0.05	100	100	WIRE	69.06					11,100
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,400
AP-3	CABLE		-										<u> </u>					
AL-9	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60	0	Routed in 5" Conduit	0.69	0	0	WIRE	69.06	0				C
	Power Cables for MCC's	3/C 500kcmil, 600kV	Est	250	LF	14.70	3,675	Routed in 3" Conduit	0.69	173		WIRE	69.06	11,913				15,600
	Power Cables for 480V Switchgear	3/C 4/0kcmil, 5kV	Est	250	LF	8.40	2,100	Routed in 2" Conduit Routed in 1-1/2"	0.35	88	88	WIRE	69.06	6,043				8,100
100	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30	0	Conduit	0.52	0	0	WIRE	69.06					C
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	150	LF	0.76		Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549				700
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	LF	1.58	0	Routed in 3/4" Conduit Routed in 1-1/2"	0.05	0	0	WIRE	69.06	0				<u> </u>
	Power Cables from MCC to Loads - 50 HP	3/C #4, 600V	Est	950	LF	2.10		Conduit Routed in 1-1/2"  Routed in 1-1/2"	0.09	86	86	WIRE	69.06	5,905				7,900
<u> </u>	Power Cables from MCC to Loads - 100HP	3/C #4/0, 600V	Est	150	LF	9.45	1,418	Conduit	0.50	75		WIRE	69.06					6,600
	Power Cables from MCC to Loads - 150HP	3/C #350, 600V	Est	300	LF	10.50	3,150	Routed in 2" Conduit	0.69	207	207		69.06					17,400
	Control Cables - Pumps	5/C #14, 600V	Est	150	LF	0.67		Routed in 3/4" Conduit	0.03 0.04		5	WIRE WIRE	69.06 69.06					400
L	Control Cables - TR Sets Instrumentation Cables	7/C #14, 600V 2 PR #16 SHLD	Est Est	750	LF LF	0.81 0.25		Routed in 1-1/2" Routed in 3/4" Conduit	0.04			WIRE	69.06					1,800
	Data Highway Cable	Z ITR # IU SPILU	Est	1,000	LF	3.15		Routed in 3/4" Conduit	0.03	32		WIRE	69.06	2,210				5,400
							:											
AP-4	RACEWAY 3/4" Conduit		Est	2,300	LF	2.06	4,733		0.19	446	446	ECND	49.67	22,163				26,900
	1-1/2" Conduit		Est	1,100	LF	4.67	5,140		0.13	312	312	ECND	49.67	15,517		<del></del>		20,700
	2" Conduit		Est	550	LF	6.25	3,436		0.35	194	194	ECND	49.67	9,616				13,100
	3" Conduit		Est	900	LF	13.13		1	0.65	581	581	ECND	49.67	28,833				40,600
	5" Conduit		Est	0	LF	38.33	0		1.13	0	0	ECND	49.67					0
AP-5	DCS SYSTEM ADDITIONS																	
	Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,700
AP-8	DCS PROGRAMMING/INTERFACE																	
	Interface Hardware		Est	1	EA	2,625.00	2,625		20.00	20		EHEC	59.36	1,187				3,800
-	Programming /Interface		Est	1	LT	5,250.00	5,250		0.00	0	0	WIRE	69.06	0				5,300
<u> </u>	LIGHTING ALLOWANCE		Est	1	LT	10,500.00	10,500		100.00	100	100	INEL	60.02	6,002				16,500
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						875,382				8,684			475,887				1,351,400
- 1																		

						Louis	ville Gas & E	lectric				1				E	Estimate No.:	: 21988B
	& Lundy LLC						lill Creek Uni										Project No.:	: 10584-022
Chic	ago						Mitigation S			:							Date	: 12/20/2005
_	Cost Type: Est = Estimated, Bid = Vendor quote						ption 5 - Tro		-			-		ļ			-	1/27/2006
	oost Type. Lat - Estimated, Did = Vendor quote						lagnitude Co		Wage Rates	Donad and		1					<del> </del>	: 1/27/2006
					<del></del>		ONFIDENTI	<b>1</b>	Labor Produ			<del> </del>	Louisville	e, KY			Preparer: Reviewer:	
																	neviewer.	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE																
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,150.00	3,150		1170.00	1,170	1,170	PNTR	55.58	65,029				68,200
MISC-2	ROADWORK		Est	0	LS	36,750.00	0		380.00	0	C	PBIT	62.43	0				(
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4	OTHER													•				
	BLOWER HOUSE														·		<b> </b>	A 1
	PREFAB BLDG (15' x 20' )			1	LS	38,000.00	38,000		130.00	130	120	STST	86.46	11,240				40.00
	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	25	CY	157.50			7.00		175		52.91	9,259				49,200 13,200
MISC-5	CFD MODEL STUDY		Est	1	LS	30,000.00	30,000		40.00	40	40	STST	86.46	3,458				33,50
MISC-6	TANK BERM		Est	1	LS	0.00	0		260.00	260	260	STST	86.46	22,480				22,50
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	0.00	0		60.00	60	60	STST	86.46	5,188				5,20
MISC-5	MISC. SUBTOTAL						82,438				2,135			132,244				214,700
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,000
	SUBTOTAL						2,237,192			0	16,670	-		1,115,972				3,353,200
	Craft Support During Startup	At 3% of Total Manhours									500	MECH	66.86	33,437				33,400
	Allowance for Premium Time Labor Productivity Loss Due To Overtime																	Not Included Not Included
	Per Diem Expense																	Not Included
	Project Wrap (Efficacy) Insurance Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs																Not Included 167,700
	Erection Contractor's Profit	At 8% of Material and Labor Costs	,									<del></del>						268,300
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs														<u>.</u>	- 4	Included w\Equipment Costs

			-		1	Louis	ville Gas & E	lectric									Estimate No.	21988B
Sargent	& Lundy <sup>LLC</sup>				<del>                                     </del>		lill Creek Uni			-			<del> </del>				Project No.	1
Chica							Mitigation S											: 12/20/2005
				<u> </u>			ption 5 - Tro					-	-	-				<del> </del>
	Cost Type: Est = Estimated, Bid = Vendor quote			-														1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote				ļ		lagnitude Co		-								Run Date	: 1/27/2006
						-C	ONFIDENTIA	\L-	Wage Rates	Based on:			Louisville	, KY			Preparer	:
									Labor Produ	ctivity =		-	1				Reviewer	:
																	1	
item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Waqe Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
												·					<b> </b>	Included
	Special Tools	Included w\Equipment Costs																w\Equipment Costs
		At 0.5% of																
	Consumables	Equipment/Material Cost					-											11,200
	Freight To Site	At 4.5% of					1.4											1
^	Taxes - Sales/Use/VAT/Business/Etc.	Equipment/Material Cost															<u> </u>	100,700
	Construction Utilities (Elect, Water, etc.) During			<u> </u>														Not Included
,4	Construction	Furnished by Owner																By Owner
	SUBTOTAL INSTALLED COST									0	17,170			1,149,409				3,934,500
														.,,				0,001,000
	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team								0								393,500
PERMITT	ING, MODELING, ETC.								·	0								0
STARTUR	PREAGENT TESTING (15 DAYS)	·								0								50,000
CONTING		At 20% of Total								0					1			875,600
	NTERNAL COST	To Be Furnished by Owner	-							0								100,000
L LAT	ARTS	Not look dod								0				****				Not Included
	T DURING CONSTRUCTION (AFUDC)	Not Included Not Included							ļļ									0
INTERES	T DOMING CONSTRUCTION (APODC)	INOT INCIDIDED																0
	PROJECT TOTAL :																	5,353,600

						Louis	ville Gas & E	lectric								1	Estimate No.:	21990B
Sargent 8	k Lundy <sup>LLC</sup>					N	lill Creek Uni	t 3									Project No.:	10584-022
Chica			***************************************				Mitigation S								12		Date:	12/20/2005
			1				Horizontal F								:		Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co						1		-		Run Date:	1/27/2006
							ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer:	
									Labor Produ	ctivity =		<u> </u>	1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract S	DOR (Furnish)	DOR (Install)	Total Projected Cos
	DUCTWORK MODIFICATIONS	COSTS																***************************************
												<u> </u>						
	WEOD & ACCOCIATED FOLUD	<u> </u>			<u> </u>							ļ	<b> </b>				<u> </u>	
<b> </b>	WESP & ASSOCIATED EQUIP				<del> </del>							1	<b> </b>				<b> </b>	
					1		<u> </u>											
	WESP (Two ESP boxes, with 29 feet three fields, 9 feet long 1st field at 9.75" spacing with 76 gas passages, and 11 feet long 2nd and 3rd fields at 11.75" spacing with 64 passages, total 170 SCA. All internal 2205, with 2205 carbon steel clad alloy plate construction)	INCLUDES ALL ASSOCIATED DUCTWORK AND WASTE WATER EQUIPMENT,PIPING AND TANKS	Est	1	EA	31,570,000.00		BUDGETARY INPUT FROM VENDOR	142817	142,817	142,817	PREC	86.72	12,385,047				43,955,000
	Chimney Liner Adjustment ( WITH MODIFIED	RETURN TO EXISTING																
	BREECHING AT WESP OUTLET ELEVATION)	BREECHING	Est	0	LF	5,302.50	0		55	0	0	PREC	86.72	-0				(
1112	Briccormidat Webi Goreer Ecevarion)	Briezoriiiva				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,												
WF-3	Chimney Breaching Adjustment		Est	0	LS	21,000.00	0		220	0	0	PREC	86.72	0				(
									400.00	3.55	400	OTOT	00.40	0.010			<u> </u>	00.00
<u>\</u>	Electrical Building	20'x40'	Est	<u> </u>	EA	21,000.00	21,000		100.00	100	100	STST	86.46	8,646			<b></b>	29,600
		INCLUDES EXCAVATION &			<del> </del>							<b> </b>					<b> </b>	
WE-5	FOUNDATIONS	BACKFILL	Est	810	CY	157.50	127,575		7.00		5,670	CONP	52.91	300,000				427,600
WE-6	STRUCTURAL STEEL		Est	170	TN	2,200.00	374,000		16.00	2,720	2,720	STST	86.46	235,171				609,200
WE-7	AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	2,000	LF	10.00		Add the second s	0.52	1,040		PILE	82.81	86,122				106,100
	FIBER GLASS DUCT 23' DIA		Est	450	LF	7,200.00			50.00	22,500	22,500	DUCT	59.32	1,334,700				4,574,700
WE-8	WE SYSTEM SUBTOTAL				-		35,352,575				174,847	<b></b>		14,349,686				49,702,200
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE				<del>                                     </del>													
	SWITCHGEAR New Breaker at Existing 13.2kV Switchgear	Double Ended Unit Substation with (2) 2MVA, 6.9- 480V XFMR's	Est Est	1 1	EA EA	575,000.00 63,000.00	575,000 63,000		500.00 100.00	500 100	500 100	EHEA EHEA	53.92 53.92	26,960 5,392				602,000 68,400
	MCC		Est	2	EA	52,500.00	105,000		240.00	480	480	EHEA	53.92	25,882				130,900
	Misc Electrical Equipment & Controls		Est	1	LS	86,100.00	86,100		324.00	324	324	EHEA	53.92	17,470				103,600
100	OPOLINIDINO																	
	GROUNDING Cable - 500kcmil GND		Est	2,000	LF	2.10	4,200		0.05	100	100	WIRE	69.06	6,906				11,100
	Grounding Rod	<u> </u>	Est	12	EA	199.50	2,394		4.00	48	48		82.81	3,975				6,400
	CABLE	0/0 7501 '/ 5/3/	F-/	400	<u> </u>	00.00	0.000	Routed in 5" Conduit	0.69	69		WIRE	69.06	4,765				8,100
	Power Cables for MCC's	3/C 750kcmil, 5kV 3/C 500kcmil, 5kV	Est Est	100 0	LF LF	33.60 14.70		Routed in 3" Conduit	0.69	09 1	0 09	WIRE	69.06	4,705 A				0,100 0
	Power Cables for MCC's Power Cables for Switchgear	3/C 500kcmil, 5kV 3/C 4/0kcmil, 5kV	Est	1,000	LF LF	8.40	8.400	Routed in 2" Conduit	0.05	350	350	WIRE	69.06	24,171				32,600
	1 One: Cables for Ownerigear	O/O T/OROTHII, ORV		.,000	<del>-</del>			Routed in 1-1/2"										
		3/C #2/0, 600V	Est	2,400	LF	6.30	15,120	Conduit	0.52	1,248	1,248	WIRE	69.06	86,187				101,300
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	0	LF	0.76		Routed in 3/4" Conduit	0.05	0	0	WIRE	69.06	0	:			0
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	1,500	LF	1.58		Routed in 3/4" Conduit Routed in 1-1/2"	0.05	80	80	WIRE	69.06	5,490				7,900
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est		LF	2.12		Conduit	0.09		۸	WIRE	69.06	0		* .		0

Company   Comp				1	T-	T	Louis	villa Gae & F	Iloctric	T			T	1	T			stimate No.:	21000B
Search   S		uc				-													
Company   Comp	Sargent &	Lundy																<del> </del>	
Order of the protect contract field and provided Coal Estimate	Cilicay	0																ļ	
Control   Cont	1 -	Cost Type: Fst = Estimated, Bid = Vendor quote										1						ļ	
Renks   Presentation   Presentatio		7,000								Wage Rates	Based on:			Louisville	, KY			ļ	
Infert   No.   Properties   P				<del> </del>	<u> </u>	<u> </u>				_				1				ļ	
Infert   No.   Properties   P																			
Devel Cables From IRCO to Logical - SOFP   SC 44 - CODY   Est   0   F   2.67   OCCUPANT   D.15   C   C   WINE   60.05   SOF   C   C   C   C   C   C   C   C   C	. <u>Item No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity			<b>Equipment or</b>	Cost Development	hours	Man-	hours, Prod	Crew Code	Crew Wage Rate	Construction & Erection	Sub- Contract <u>S</u>	DOR (Furnish)		<u>Total</u> <u>Projected Cos</u>
Devel Cables From IRCO to Logical - SOFP   SC 44 - CODY   Est   0   F   2.67   OCCUPANT   D.15   C   C   WINE   60.05   SOF   C   C   C   C   C   C   C   C   C										•									
Prove Calibration Mode De Loude, 90 PP   30 C 2, 5007   California   10 PP   3.58   O Penantial no Consult   0.05   O PP   0.0	1.	Octobro from MOO to Londo FOLID	0/0 #4 600\/	Eat		1.5	2.67	٠,		0.35	,		WIDE	60.06					
Control Califies: Principal   Sc 914, 5600   Est   1,560   UF   0.87   1,000   Internation   0.08   48   44   WIFE   69.05   3,515							3.58			0.35	0		WIRE	69.06	0				
Confection - Tri day   Confection - Tri day									Routed in 3/4" Conduit	0.03	48	48							4,30
International Carloling   29 Ft i 6 Std   750   LF   0.25   168 Report of 34* Cendent   0.03   26   28 WHE   9.08   1.457					0.45-								14000						
Dim Highway Calles									Routed in 3/4" Conduit	0.04	96	96			6,630				8,60 1,80
Sef Conduit			2 PR # 16 SHLD	Est								32							1,80 5,40
Sef Conduit	AP-4	RACEWAY																	
2 Consider		3/4" Conduit											ECND						55,50
ST CONDITION   Eat   O   LF   13.13   O   0.66   O   CEXID   48.67   O										0.28									45,10
ST CONDUCT   AP-6   CONTROL   Est   100   LF   88.83   3.888   1.19   115   115   END   49.67   5.588								6,248			352	352	ECND						23,70
Cabhels Est 1 EA 91,500,00 31,500 40,00 40 40 EHA S3,22 2,157 3  AA'-8 DCS PEOGRAMMIGNITERFACE  Est 1 EA 2,565,00 2,055  InterSoc Radionary  Figure Programming Interface  Est 1 LT 5,550,00 5,250 0,00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0								3,833			113	113							9,40
AP-8   DS PROGRAMMING/INTERFACE   Est   1   EA   2,025,00   2,655   20,00   20   20   EHED   59,36   1,187				Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,70
Interface Nativarie														-					
Programming Interface				Est	1	EA	2,625.00				20	20	EHEC	59.36	1,187				3,80
AP-10 AUXILIARY POWER SYSTEM / I&C SUBTOTAL  AP-10 AUXILIARY POWER SYSTEM / I&C SUBTOTAL  REINFORCING OF EXISTING EQUIPMENT  NONE  DEMOLITION / RELOCATIONS  NONE  MISC-LANEOUS  NONE  MISC-1 PAINTING  Touch-up and Field Finish  Est 1 LS 87,150,00 87,150 3250,00 3,250 3,250 PNTR 55.56 180,635  26'  MISC-2 ROADWORK  GRAVEL  Est 1 LS 45,937.50 45,938 380,00 380 380 PDT 62.43 23,723 66'  MISC-3 STORM DRAINAGE  Est 1 LS 7,350.00 7,350 300.00 300 300 YORN 51.97 15,591 22'  MISC-4 OTHER  MISC-5 MISC-5 PHYSICAL MODEL STUDY  Est 1 LS 120,000.00 120.000 40,00 40 40 STST 86.46 3,458 12'  MISC-5 MISC-5 SUBTOTAL  GENERAL SUPPORT				Est	1	LT	5,250.00	5,250		0.00	0	0	WIRE	69.06	0				5,30
REINFORCING OF EXISTING	AP-9 I	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,80
REINFORCING OF EXISTING	AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						957,418				5,776			336,065				1,293,70
DEMOLITION / RELOCATIONS   NONE		REINFORCING OF EXISTING	NONE																
MISC-1 PAINTING TOUCH-up and Field Finish Est 1 LS 87,150.00 87,150 3250.00 3,250 3,250 PNTR 55.58 180,635 266  MISC-2 ROADWORK GRAVEL Est 1 LS 45,937.50 45,938 380.00 380 PBIT 62.43 23,723 666  MISC-3 STORM DRAINAGE Est 1 LS 7,350.00 7,350 300.00 300 YDRN 51.97 15,591 2266  MISC-4 OTHER STORM DRAINAGE Est 1 LS 120,000.00 120,000 40.00 40 STST 86.46 3,458 1226  MISC-5 PHYSICAL MODEL STUDY Est 1 LS 120,000.00 120,000 40.00 40 40 STST 86.46 3,458 1226  MISC-5 MISC-5 SUBTOTAL 260,438 3,970 223,408 483																			
MISC-1 PAINTING TOUCH-up and Field Finish Est 1 LS 87,150.00 87,150 3250.00 3,250 3,250 PNTR 55.58 180,635 266  MISC-2 ROADWORK GRAVEL Est 1 LS 45,937.50 45,938 380.00 380 380 PBIT 62.43 23,723 666  MISC-3 STORM DRAINAGE Est 1 LS 7,350.00 7,350 300.00 300 300 YDRN 51.97 15,591 226  MISC-4 OTHER STORM DRAINAGE Est 1 LS 120,000.00 120,000 40.00 40 40 STST 86.46 3,458 1223,408 483  MISC-5 PHYSICAL MODEL STUDY Est 1 LS 120,000.00 120,000 40.00 40 40 STST 86.46 3,458 1223,408 483		DEMOLITION / RELOCATIONS	NONE	<b> </b>	<u> </u>														
MISC-2 ROADWORK GRAVEL Est 1 LS 45,937.50 45,938 380.00 380 980 PBIT 62.43 23,723 664  MISC-3 STORM DRAINAGE Est 1 LS 7,350.00 7,350 300.00 300 300 YDRN 51.97 15,591 22  MISC-4 OTHER  MISC-5 PHYSICAL MODEL STUDY Est 1 LS 120,000.00 120,000 40.00 40 40 STST 86.46 3,458 123  MISC-5 MISC. SUBTOTAL 260,438 3,970 223,408 483		MISCELLANEOUS	NONE																
MISC-2 ROADWORK GRAVEL Est 1 LS 45,937.50 45,938 380.00 380 PBIT 62.43 23,723 660  MISC-3 STORM DRAINAGE Est 1 LS 7,350.00 7,350 300.00 300 300 YDRN 51.97 15,591 22  MISC-4 OTHER STORM DRAINAGE Est 1 LS 120,000.00 120,000 40.00 40 STST 86.46 3,458 123  MISC-5 PHYSICAL MODEL STUDY Est 1 LS 120,000.00 120,000 40.00 40 40 STST 86.46 3,458 123  MISC-6 MISC. SUBTOTAL 260,438 3,970 223,408 483	MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	87,150.00	87,150		3250.00	3,250	3,250	PNTR	55.58	180,635				267,800
MISC-2 ROADWORK GRAVEL Est 1 LS 45,937.50 45,938 380.00 380 380 PBIT 62.43 23,723 669  MISC-3 STORM DRAINAGE Est 1 LS 7,350.00 7,350 300.00 300 YDRN 51.97 15,591 22  MISC-4 OTHER State 1 LS 120,000.00 120,000 40.00 40 40 STST 86.46 3,458 122,000.00 120,000 40.00 40 40 STST 86.46 3,458 122,000.00 40.00 40 40 STST 86.46 3,458 483  MISC-5 MISC-5 WISC-SUBTOTAL 260,438 3,970 223,408 483																			
MISC-3 STORM DRAINAGE  Est 1 LS 7,350.00 7,350 300.00 300 YDRN 51.97 15,591 22  MISC-4 OTHER  MISC-5 PHYSICAL MODEL STUDY  Est 1 LS 120,000.00 120,000 40.00 40 40 STST 86.46 3,458 122  MISC-5 MISC. SUBTOTAL  GENERAL SUPPORT	MISC-2	ROADWORK		Est	1	LS	45,937.50	45,938		380.00	380	380	PBIT	62.43	23,723				69,700
MISC-4 OTHER  MISC-5 PHYSICAL MODEL STUDY  Est 1 LS 120,000.00 120,000 40 40 STST 86.46 3,458 123  MISC-5 MISC. SUBTOTAL  GENERAL SUPPORT  GENERAL SUPPORT					1	IS				300.00	300	300	YDRN	51.97	15.591				22,900
MISC-5 PHYSICAL MODEL STUDY Est 1 LS 120,000.00 120,000 40 40 STST 86.46 3,458 123  MISC-5 MISC. SUBTOTAL 260,438 3,970 223,408 483							7,000.00	7,000							. 0,001				,00
MISC-5 MISC. SUBTOTAL 260,438 3,970 223,408 483  GENERAL SUPPORT	MISC-4	OTHER		-															
GENERAL SUPPORT	MISC-5	PHYSICAL MODEL STUDY		Est	1	LS	120,000.00	120,000		40.00	40	40	STST	86.46	3,458				123,500
	MISC-5	MISC. SUBTOTAL						260,438				3,970			223,408				483,900
							·	<u> </u>							:	1			
		GENERAL SUPPORT			2	:.				:									
100 1 IMODILIZATION/DEMORILIZATION/ 1	GS-1 I	MOBILIZATION / DEMOBILIZATION		Est	1	LT		n		<u> </u>		ž.			100,000				100,000

Sargent &	110	1					ville Gas & E			1	1	1	1					: 21990B
Chica	& Lundy ===					M	ill Creek Uni	t 3									Project No.	: 10584-022
-	ago					SO3	Mitigation Sy	ystem									Date	12/20/2005
1						Option 7 -	Horizontal F	low WESP									Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co										Run Date	1/27/2006
<u> </u>	Cost Type. Est = Estimated, Did = Vendor quote						ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer	:
							T. T. T. T. T. T. T. T. T. T. T. T. T. T		Labor Produ				1				Reviewer	:
<b> </b>																		
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	<u>Total</u> Projected Cost
			-			-												
<b></b>								Includes freight in and	-									
GS-2	CRANE RENTAL	700 Ton - 2 months	Est	1	LT		0	out						310,000	:			310,000
											ļ			410,000				410,000
GS-2	GENERAL SUPPORT SUBTOTAL										U			410,000		-		410,000
	SUBTOTAL				<b> </b>		36,570,431			0	184,593			15,319,159				51,889,800
<del></del>	SUBTUTAL																	0
	Craft Support During Startup	At 3% of Total Manhours									5,538	MECH	66.86	370,256				370,300
	Allowance for Premium Time Labor																	Not Included Not Included
	Productivity Loss Due To Overtime							···										Not included
	Per Diem Expense																	Not Included
	Project Wrap (Efficacy) Insurance Erection Contractor's General & Administrative	At 5% of Material and Labor																
•	Costs	Costs - WESP																1,016,000
	Erection Contractor's Profit	At 8% of Material and Labor																1 605 600
l	Erection Contractor's Front	Costs - WESP															•	1,625,600 Included
							. 2						-			-		w\Equipment
1	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs									1.5							Costs
<b></b>	Ivialidatory Spare Faits (Start-up/Testing)	moradoa William Cook																Included
																·	A 1	w\Equipment
	Special Tools	Included w\Equipment Costs																Costs
		At 0.5% of Equipment/Material Cost																182,900
	Consumables	At 4.5% of			<u> </u>													
	Freight To Site	Equipment/Material Cost																1,645,700
	Taxes - Sales/Use/VAT/Business/Etc.																	Not Included
	Construction Utilities (Elect, Water, etc.) During			ŀ														By Owner
	Construction	Furnished by Owner			1													2, 0
	SUBTOTAL INSTALLED COST									0	190,131			15,689,415				56,730,300
	SOBTOTAL INSTALLED COCT																	
ENGINE	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team								0								2,553,000
PERMIT	TING, MODELING, ETC.	<u> </u>								0								100,000
	P AND TESTING	At 20% of Total		<del> </del>	1					0								11,876,700
CONTING	GENCY NTERNAL COST	To Be Furnished by Owner		<b>_</b>	1					0						***************************************		200,000
SPARE F		To bo t difficulty of the								0								Not Included
ESCALA <sup>*</sup>	TION	Not Included										-						0
INTERES	ST DURING CONSTRUCTION (AFUDC)	Not Included		<b></b>	<b>_</b>											***************************************		0
	PROJECT TOTAL :				<b>_</b>				<del>  </del>								***************************************	71,460,000

	& Lundy <sup>LLC</sup>					Louis	ville Gas & E	lectric			T	T	1	T .	1			1
Chica							lill Creek Uni					-					Estimate No.:	
						SO3	Mitigation S	vstem	-		1.	1		-			Project No.:	
	Cost Type: Est = Estimated, Bid = Vendor quote					Ontio	n 1 - Hydrate	d Lime	-				-	-			Date:	12/20/2005
-	77 Lot - Louillated, Did = Vendor quote					Order of M	egnitude Ce	ot Cotionata		-							Rev Date	1/27/2006
-					-		agnitude Co										Run Date:	1/27/2006
						-0	ONFIDENTIA	\L-	Wage Rates				Louisville	, KY			Preparer:	
									Labor Produ	uctivity =			1				Reviewer:	
1																		
em No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected
	DUCTWORK MODIFICATIONS									-								
- In	MODIFY GAS DUCT TO ACCEPT INJECTION										:						1	
V-1	NUZZLES		-						1									
	DUCTWORK MODS			<u> </u>														
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	TN	2,625.00	2,625		35.00	35	o.	FLDU		- 10-				
V-2 [	OLICTWORK OLIPPOST		Est	200	SF	8.40	1,680		0.27	54	35	DINS	89.66 59.32	3,138				5
	DUCTWORK SUPPORT STRUCTURES STRUCTURAL STEEL			<u> </u>					"-"	54	34	פאוועס	39.32	3,203				4
	ACCESS & GALLERIES		Est	5	TN	1.000.00									<b> </b>			
			Est	400	SF	1,890.00 31.50	9,450		16.00	80	80	STST	86.46	6,917				16
					<u> </u>	31.50	12,600		0.40	160		GALL	71.2	11,392				24
-4 D	DUCTWORK SUBTOTAL																	
							26,355											
							20,000				329			24,650				5
<u>                                      </u>	njection System																	
													-					
E	QUIPMENT/COMPONENTS												-					
/	Air Blowers	150 hp each												<del></del>				
\	VFD Rotary Feeder	3 hp - Stainless Steel	Est	5	EA	55,125.00	275,625		105.00	EDE		DITTO						
- 1		2,937,600 lb full - 19,615 ft <sup>3</sup> -	Est	3	EA	10,500.00	31,500		30.00	525 90		PUMP	65.83	34,561				310
1 ;	Long-Term Storage Silo - Common for 2 Units (10	D=20.5' - H=82.0' - CS Silo - SS							30.00	90	90	TANK	65.78	5,920				37
	and 4	Hopper	Est	1	EA	909 000 00							ŀ					
ľ		293,760 lb full - 1,920 ft <sup>3</sup> -	T =			808,000.00	808,000		2545.52	2,546	2,546	TANK	65.78	167,444	1			975
s	First roin Glorage Silo - 1/4 Horire)	D=8.5' - H=38.0' - CS Silo - SS	_	l		1								, , , , ,				9/0
11	njection Manifold (2 Otv)	Hopper Stainless Steel	Est	1	EA	200,000.00	200,000		764.00	764	70.	<b>TANIL</b>	05				1	
Ir	njection Nozzles (50 Qtv)	Stainless Steel	Est Est	2	EA	10,500.00	21,000		240.00	764 480	/64	TANK MECH	65.78 66.86	50,256				250
	System Piping		ES( ·	1	LT	10,500.00	10,500		240.00	240	240	MECH	66.86	32,093 16,046	<u> </u>			53
	8" - CS	Includes fitting allowance	Est	250	-,						240	.VILOIT	00.00	10,046	·			26
P	iping insulation & Lagging	gvalloc	Est	350 0	LF	18.48	6,468		0.46	161	161	SPNG	70.4	11,334				
	Heat Tracing		Est	0	LF LF	6.62	0		0.14	0		INSUL	53.39	11,334				1.7
	/alves	Allowance	Est	1		0.00	0		0.00	Ō	ŏ	WIRE	69.06	70				
-   S	Supply Piping Water Supply				LS	1,050.00	1,050		24.75	25		SPNG	70.4	1,742				2
	Air Count	Allowance	Est	0	LS	940.00								1,7-72				2,
	ining C	Allowance	Est	0	LS	840.00	0		100.00	0		SPNG	70.4	o				
Pi	ining Pack	Allowance	Est	1 +	LS	525.00	0		80.00	0	0	SPNG	70.4	O				
<del>-   - ' '</del>	17	Allowance	Est	10	TN	1,575.00 2,200.00	1,575		60.00	60	60	SPNG	70.4	4,224			<del></del>	5,
FOL	ONDY HONZ	NCLUDES EXCAVATION &				۷,200.00	22,000		16.00	160	160	STST	86.46	13,834				
ST	TRUCTURAL STEEL	BACKFILL	Est	50	CY	157.50	7,875		7.00	25.								
AUC	CED CACT DUES (188	00 ft LONG	Est	10	TN	2,200.00	22,000		7.00 16.00	350 160	350 (	CONP	52.91	18,519				26,
		JO A LONG	Est	2,200	LF	10.00	22,000		0.52	1,144	160 1,144	STST	86.46	13,834				35,
IS S	SYSTEM SUBTOTAL								0.52	1,144	1,144	rile	82.81	94,735				116,
- I	TEDIAL LINE CONTROL						1,429,593				6,704			464,542				4 00 4
MA	TERIAL UNLOADING SYSTEM										0,704			404,542				1,894,
	JCK DELIVERY IN	ICLUDED IN SILO	Est	0	Set	045.000.00												
AU	XILIARY POWER SUPPLY	-			261	315,000.00	0		1753.67	0	0 8	SPNG	70.4	0				
SYS	STEM/I&C				-													
	WED COURSE								1			ŀ	1	ŀ				
POW	VER SOURCE																1.1	

						1!	/ille Gas & E	lectric								E	stimate No.:	21991B
							ill Creek Unit										Project No.:	
Sargent &	Lundy LLC																<del> </del>	12/20/2005
picaç	20						Mitigation Sy		1						<b> </b>		Rev Date	
1							1 - Hydrated		-								ļ	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Cos	si Estimate	Wage Rates	Paged and			Louisville	KV			Preparer:	<del> </del>
	000t ()per 201 = 20111111111					-C	ONFIDENTIA	L-	4				Louisville	, KI			Reviewer:	
									Labor Produ	ctivity =	-						neviewei.	
															<u> </u>			
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
									-									
		Double Ended Unit Substation																
		with (2) 2MVA, 6.9-480V	F-4	1 .	EA	575,000.00	575,000		500.00	500	500	EHEA	53.92	26,960				602,000
		XFMR's	Est Est	1	EA	63,000.00			100.00	500 100	100	EHEA	53.92	5,392				68,400
	New Breaker at Existing 6900V Switchgear		Est	2	EA	42,000.00	84,000		200.00	400	400	EHEA	53.92					105,600
	MCC		Est	1	LS	60,900.00			300.00	300	300	EHEA	53.92	16,176			<b></b>	77,100
	Misc Electrical Equipment & Controls								-			<b> </b>					<del></del>	
AP-2	GROUNDING				<del>                                     </del>	2.10	4,200		0.05	100	100	WIRE	69.06	6,906				11,100
A	Cable - 500kcmil GND		Est	2,000	LF EA	199.50	2,394		4.00		48	PILE	82.81	3,975				6,400
	Grounding Rod		Est	12	L EA	199.50	2,034		1	l i								
					<del> </del>													
AP-3	CABLE	3/C 750kcmil, 5kV	Est	0	LF	33.60		Routed in 5" Conduit	0.69			WIRE	69.06					45.000
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	250	LF	14.70		Routed in 3" Conduit	0.69	173	173	WIRE	69.06	11,913			ļ	15,600
<u> </u>	Power Cables for MCC's Power Cables for 480V Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.40	0	Routed in 2" Conduit Routed in 1-1/2"	0.35		0	WIRE	69.06	<u> </u>				<u> </u>
		:					,	Conduit	0.52	٨	n	WIRE	69.06			<u> </u>		
		3/C #2/0, 600V	Est	0	LF LF	6.30		Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549				700
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	150 150	LF LF	1.58		Routed in 3/4" Conduit		8	8	WIRE	69.06	549				800
1	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	150	<u> </u>	1.30		Routed in 1-1/2"										
	Power Cables from MCC to Loads - 50 HP	3/C #4, 600V	Est	150	LF	2.10		Conduit Routed in 1-1/2"	0.09			WIRE	69.06					1,200
1	D Oablas from MOO to Londo 100UD	3/C #4/0, 600V	Est	150	LF	9.4		Conduit	0.50	75		WIRE	69.06 69.06					6,600 17,400
	Power Cables from MCC to Loads - 100HP Power Cables from MCC to Loads - 150HP	3/C #4/0, 600V	Est	300	LF	10.50		Routed in 2" Conduit	0.69 0.03		207	WIRE	69.06	14,295				400
-	Control Cables - Pumps	5/C #14, 600V	Est	150	LF	0.6	101	Routed in 3/4" Conduit Routed in 1-1/2"	0.03	1	3	VVIITE	03.00	1	1,			1
ļ	Control Capico 1 ampo		_	1 _		0.8	.	Conduit	0.04	l o	o	WIRE	69.06	. c				<b> </b>
	Control Cables - TR Sets	7/C #14, 600V	Est	750	LF LF	0.8	189	Routed in 3/4" Conduit	0.03	24	24	WIRE	69.06	1,657				1,800 5,400
	Instrumentation Cables	2 PR #16 SHLD	Est Est	1,000	LF	3.1		Routed in 3/4" Conduit	0.03		32	WIRE	69.06	2,210				5,400
	Data Highway Cable		Lat	1 ,,,,,,,							***************************************					<u> </u>		
45.4	DACEWAY			100			J		0.19	446	110	ECND	49.67	22,163				26,900
AP-4	RACEWAY 3/4" Conduit		Est	2,300	LF	2.0			0.19		440 85	ECND	49.67					5,600
	1-1/2" Conduit		Est	300	LF LF	4.6 6.2			0.25		106	ECND	49.67	5,245				7,100
	2" Conduit		Est	300 900	LF	13.1			0.65	581	581	ECND	49.67	28,833				40,600
	3" Conduit		Est Est	900	<del>  L</del> F	38.3		)	1.13	0	0	ECND	49.67	<u> </u>				
	5" Conduit		Loi	1 <u> </u>					_	1							<b> </b>	
45.5	DCS SYSTEM ADDITIONS						04 500		40.00	40	. 40	EHEA	53.92	2,157	<u> </u>			33,700
AP-5	Cabinets		Est	11	EA	31,500.0	31,500	<u> </u>	40.00	40	40		55.32	£,107				50,700
	DOO DDOODALA INIO/INITEDEACE		1						00.00			EHEC	59.36	1,187				3,800
AP-8	DCS PROGRAMMING/INTERFACE Interface Hardware		Est	1	EA	2,625.0	0 2,625 0 5,250		20.00	20	20	WIRE	69.06					5,300
	Programming /Interface		Est	1	LT	5,250.0	5,250	1	0.00	1 1		· · · · · · · · · · · · · · · · · · ·	55.00					5,500
-	1 Togramming / Internace		<del> </del>	1	LT	10,500.0	0 10,500		100.00	100	100	INEL	60.02	6,002				16,500
AP-9	LIGHTING ALLOWANCE		Est	1	- L1	10,300.0	10,000							-				
			-											300 615				4 000 000
10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						871,538	3			3,370			188,413				1,060,000
	DEINEODCING OF EVICTING						ľ		1									
	REINFORCING OF EXISTING	NONE		<u>.</u>														
	EQUIPMENT	NONE	1. 30 31				ř · ·											
	THE PROPERTY OF THE PROPERTY O	NONE											<u> </u>			<u> </u>		
. e 🌬 wa 🤼	DEMOLITION / RELOCATIONS	NONE																

	·					Louis	ville Gas & E	lectric								E	stimate No.	21991B
Sargent &	& Lundy <sup>LLC</sup>						lill Creek Uni										Project No.	10584-022
Chica							Mitigation Sy										Date	12/20/2005
							n 1 - Hydrate										Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co										Run Date	1/27/2006
		§					ONFIDENTIA	\L-	Wage Rates	·		ļ	Louisville	e, KY			Preparer	
					-		<u> </u>		Labor Produ	uctivity =			1				Reviewer	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
	MICCELLANEOUS	NONE																
	MISCELLANEOUS	INOINE			:													
	PAINTING	Touch-up and Field Finish	Est	1	LS	3,150.00			1170.00	1,170	1,170	PNTR	55.58	65,029				68,20
MISC-2	ROADWORK		Est	0	LS	36,750.00	0		380.00	0	0	PBIT	62.43	0				
MISC-3	STORM DRAINAGE		Est	0	LS	7,350.00	0		300.00	0	0	YDRN	51.97	0				
MISC-4	OTHER																	
	BLOWER HOUSE			-	<u> </u>				-						<b></b>			
	BLOWER HOUSE	INCLUDES EXCAVATION &															***************************************	
	FOUNDATIONS	BACKFILL	Est	25 1	CY LS	157.50 38,000.00	3,938 38,000		7.00 130.00	175 130	175	CONP STST	52.91 86.46	9,259 11,240				13,20 49,20
	PREFAB BLDG. 15'X20'		Est	<u> </u>	Lo	38,000.00			130.00	130								49,20
MISC- <u>5</u>	CFD MODEL STUDY	2	Est	1	LS	30,000.00			40.00	40		STST	86.46					33,50
Ñ. 6	TANK BERM		Est	1	LS	0.00	0		260.00	260	260	STST	86.46	22,480				22,50
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	0.00	0		60.00	60	60	STST	86.46	5,188				5,20
MISC-5	MISC. SUBTOTAL						75,088				1,835			116,653				191,80
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							150,000				150,00
GS-2	GENERAL SUPPORT SUBTOTAL			ļ			0				0			150,000				150,00
	SUBTOTAL						2,402,574			0	12,238		:	944,258				3,346,90
<u> </u>	Craft Support During Startup	At 3% of Total Manhours									367	MECH	66.86	24,548				24,50
	Allowance for Premium Time Labor				ļ		-4-4											Not Included Not Included
<u> </u>	Productivity Loss Due To Overtime Per Diem Expense				-								-					Not Included
	Project Wrap (Efficacy) Insurance									-	· · · · · · · · · · · · · · · · · · ·							Not Included
	Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs				4.7		,										167,30
	Erection Contractor's Profit	At 8% of Material and Labor Costs																267,80
																		Included w\Equipment
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs			_													Costs Included
	Special Tools	Included w∖Equipment Costs																w\Equipment Costs
	Consumables	At 0.5% of Equipment/Material Cost									-			:				12,00
	Freight To Site	At 4.5% of Equipment/Material Cost													l			108,10
	Taxes - Sales/Use/VAT/Business/Etc.				:							4						Not Included

3						Louis	ville Gas & E	lectric					:			E	stimate No.:	21991B
						М	ill Creek Uni	t 4									Project No.:	10584-022
	& Lundy <sup>LLC</sup>			<del> </del>	<u> </u>		Mitigation S										Date:	12/20/2005
hica	go		<u> </u>														Rev Date	1/27/2006
1							n 1 - Hydrate		-	-	-			,				+
	Cost Type: Est = Estimated, Bid = Vendor quote				and the same of th		agnitude Co											1/27/2006
		· ·				-C	ONFIDENTIA	AL	Wage Rates	Based on:			Louisville	, KY			Preparer:	
									Labor Produ	ctivity =			1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> <u>Equipment or</u> <u>Material Cost</u>	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
																		1
<u> </u>	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner														-		By Owner
					<b> </b>				<del> </del>	l	12,606			968,806				3,926,60
	SUBTOTAL INSTALLED COST		<b> </b>	-							1,							
ENGINEE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team								(								392,66
PERMITT	ring, modeling, etc.										<b></b>							50,00
STARTU	P, TESTING AND REAGENT (15 DAYS)	•			<b></b>						<b>3</b>							873,90
CONTING	GENCY	At 20% of Total			<b> </b>						<b>1</b>							100,00
	NTERNAL COST	Furnished by Owner			<u> </u>					l	<u> </u>							Not Included
SPARE F	PARTS							: :			1							NOT ITICIAGEA
ESCALA"	TION	Not Included			<b>_</b>	,					<u> </u>							
INTERES	ST DURING CONSTRUCTION (AFUDC)	Not Included										<b></b>						
					<u> </u>					l	1							5,343,16
	PROJECT TOTAL:	1	1		1			<u> </u>		<u> </u>	1							0,040,100

						Louis	ville Gas & E	lectric				1		T	ŀ		Estimate No.	21992B
	& Lundy <sup>LLC</sup>						lill Creek Uni								<b>-</b>			.: 10584-022
Chica	go					SO3	Mitigation Sy	ystem			<u> </u>	1						e: 12/20/2005
						Option 2 -	Magnesium	Hydroxide									Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co										Run Date	e: 1/27/2006
							ONFIDENTIA		Wage Rates	Based on:			Louisvill	e, KY			Preparer	
									Labor Produ	uctivity =				1			Reviewer	
											:							
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract	<u>DOR</u> (Furnish)	DOR (Install)	Total Projected Co
	DUCTWORK MODIFICATIONS																	
	MODIFY GAS DUCT TO ACCEPT INJECTION														,			
DW-1	NOZZLES			ŀ														
	DUCTWORK MODS		Est	1	TN	2,625.00	2,625		35.00	35	3.	FLDU	89.66	3,138			<b></b>	
	INSULATION & LAGGING	6" THICK INSULATION	Est	200	SF	21.00			0.27	54	54	DINS	59.32				1	5,80 7,40
DW 4	DUCTWORK SURPORT ATRUCTURE													5,200	1			1,40
DW-4	DUCTWORK SUPPORT STRUCTURES STRUCTURAL STEEL		Ent	<u> </u>	TNI	1 000 00	0.450					0=0=						
	ACCESS & GALLERIES		Est Est	5 400	TN SF	1,890.00 31.50	9,450 12,600		16.00 0.40	80 160		STST GALL	86.46				<b>†</b>	16,40
				700		31.50	12,000		0.40	100	100	GALL	71.2	11,392	1	<u> </u>	<del> </del>	24,00
																	<b>†</b>	
DW-6	BOILER MODS																	
	WALL AND TUBE MODS		Est	2	TN	2,625.00	5,250		35.00	70	70	FLDU	89.66	6,276	6			11,50
									***************************************				-					
													1		<del></del>			
DW-7	DUCTWORK SUBTOTAL						34,125				399			30,926	5			65,10
	Injection System					1							<b> </b>				<del></del>	
	Injusticia Cycloni														-			
IS-1	EQUIPMENT/COMPONENTS						***************************************						<u> </u>		<u> </u>			-
	Air Blowers	15 hp each	Est	3	EA	21,000.00	63,000		40.00	120	120	MECH	66.86	8,023			<del> </del>	71.00
	VFD Rotary Feeder	3 hp -Stainless steel	Est	1	EA	10,500.00	10,500		30.00	30	30	MECH	66.86	2,006			<del></del>	71,00 12,50
		1,617,900 lb full - 17,060 ft3 -											1					12,50
		D=26.3' - H=31.6' -	Est	1	EA	151,000.00	151,000		580.00	580	580	TANK			2			189,20
	Short-Term Storage Silo - (24 Hours) Air Compressors (2 Qty)	Not required	Est Est	0 2	EA EA	0.00 21,000.00			60.00	0	0	TANK	65.78		<u> </u>			
	Compression (2 dity)	50 hp - 2 X 100% 808,320 lb full - 8,520 ft3 -	LOL		LA	21,000.00	42,000	:	80.00	160	160	MECH	66.86	10,698	1		<del> </del>	52,70
		D=20.8' - H=25.0' - CS Silo -											l					
		SS Hopper	Est	1	EA	122,000.00			880.00	880 30	880	TANK	65.78	57,886				179,90
		20 hp - CS Shaft 125,000 lb full - 2,000 ft3 -	Est	1	EA	21,000.00	21,000		30.00	30	30	MECH	66.86	2,006				23,00
		D=13.7' - H=13.7' - CS	Est	1	EA	115,500.00	115,500		880.00	880	000	TANK	65.78	57,886				
	Slurry/Water Pumps (6 Qty)	2 hp - CS	Est	6	EA	5,250.00	31,500		20.00	120	120		65.83				<b> </b>	173,40 39,40
	Injection Manifold (2 Qty)	Stainless Steel	Est	2	EA	10,500.00	21,000		240.00	480	480		66.86				<b>——</b>	53,10
		Stainless Steel	Est	1	LT	42,000.00	42,000		96.00	96	96	MECH	66.86					48,40
	System Piping 1" - CS	Includes fitting allaware																
	4" - CS	Includes fitting allowance	Est	300	LF	2.27	680		0.16	49	49		70.4	3,464			<b></b> '	4,100
	Piping Insulation & Lagging	Includes fitting allowance	Est Est	50 350	LF LF	9.28 2.99	464 1,047		0.33	17		SPNG	70.4				<b> </b> '	1,600
	Heat Tracing		Est	350	LF	2.99	7,350		0.08 0.31	26 109	26 100	INSUL WIRE	53.39 69.06				<b> </b>	2,400
		Allowance	Est	1	LS	1,050.00	1,050		24.75	25		SPNG	70.4				<b> </b> '	14,800 2,800
	Supply Piping					.,000.00	1,000				25	J. 140	, 0.4	1,742			l'	2,800
	Water Supply	Allowance	Est	200	LS	840.00	168,000		100.00	20,000	20,000		70.4	1,408,000				1,576,000
		Allowance	Est	200	LS	525.00	105,000		80.00	16,000	16,000	SPNG	70.4	1,126,400				1,231,400
		Allowance	Est	1	LS	2,100.00	2,100		40.00	40	40	SPNG	70.4	2,816				4,900
	Piping Rack	Allowance INCLUDES EXCAVATION &	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
IS-2		BACKFILL	Est	110	CY	157.50	17,325		7.00	770	770	CONP	E0.04	40.744				
S-3	STRUCTURAL STEEL	D. CHI ILL	Est	10	TN	2,200.00	22,000		16.00	770 160	160	STST	52.91 86.46	40,741 13,834				58,100 35,800

Sargent & Lundy LLC    SO3 Mitigation System	ate No.: 21992B
Section   Sect	ect No.: 10584-022
Company   Comp	Date: 12/20/2005
Control   Cont	v Date 1/27/2006
CONFIDENTIAL-  Search State of Search   Confidential   Confident	n Date: 1/27/2006
	eparer:
	viewer:
Description   Description	
Beach   Description   Descri	<u> </u>
B.4	OR Total Stall) Projected Co
B.4	
Section   Sect	
B. S YSTEM SUPURIAL	3,810,30
ASH1 TRUCK UNLOADING SYSTEM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  SUBTOTAL STREAM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  SUBTOTAL STREAM SUBTOTAL  AND STREAM SUBTOTAL  AND STREAM SUBTOTAL  SUBTOTAL STREAM SUBTOTAL  AND STREAM SUBTOTAL  SUBTOTAL STREAM SUBTOTAL  SUBTOTAL STREAM SUBTOTAL  SUBTOTAL STREAM SUBTOTAL  AND STREAM SUBTOTAL  SUBTOTAL STREAM SUBTOTAL  SU	
ASH-1 TRUCK UNLOADING SYSTEM SUBTOTAL  AMERICAL UNLOADING SYSTEM SUBTOTAL  AUXILIARY POWER SUPPLY SYSTEM/AC  AP-1 ROWER SUPPLY SYSTEM/AC  AP-1 ROWER SUPPLY SYSTEM/AC  AP-1 ROWER SUBTOTAL  BOURDE Friedd Unit Substantial Examination with (2) 1 MVA, East 1 EA Substantial Examination with (2) 1 MVA, East 2 EA Substantial Examination with (2) 1 MVA, East 1 EA Substantial Examination with (2) 1 MVA, East 2 EA Substantial Examination with (2) 1 MVA, East 2 EA Substantial Examination with (2) 1 MVA, East 2 EA Substantial Examination with (2) 1 MVA, East 2 EA Substantial Examination with (2) 1 MVA, East 3 EA Substantial Examination with (2) 1 MVA East 2 EA Substantial Examination with (2) 1 MVA East 2 EA Substantial Examination with (2) 1 MVA East 2 EA Substantial Examination with (2) 1 MVA East 2 EA Substantial Examination with (2) 1 MVA East 2 EA Substantial Examination with (2) 1 MVA East 2 EA Substantial Examination with (2) 1 MVA East 2 EA Substantial Examination with (2) 1 MVA East 2 EA Substantial Examination with (2) 1 MVA East 2 E	
ASH 1 TRUCK UNLOADING SYSTEM SUBTOTAL	
AP-1	193,30
APPLICATION   APPLY   SYSTEM/INC	193,30
SYSTEMAC	
SwiftCHGEAR   Substitution with (2) 1 MVA,   Set   1	
SwittchgeAR   Substantion with (2) 1 MVA,   Substantion with (2) 1 MVA,   Substantion with (2) 1 MVA,   Substantion with (2) 1 MVA,   Substantion with (2) 1 MVA,   Substantion with (2) 1 MVA,   Substantion with (2) 1 MVA,   Substantion with (2) 1 MVA,   Substantion with (2) 1 MVA,   Substantion with (2) 1 MVA,   Substantion with (2) MVA,   Substantion with (2) MVA,   Substantion with (2) MVA,   Substantial with (2) M	
SWITCHGEAR   SWI	487,00
New present at Esting 1s.2xv switchgear   Est   2 EA   42,000.00   84,000   200.00   400   400   61EA   53.92   21,568   1.00	63,00
Section   East   1   LS   8,400,00   8,400   300,00   300	105,60
Cable - 500kcmil GND	24,60
Cable - 500kcmil GND	
Cashe   Cash	11,10
ABLE	6,40
Power Cables for MCC's   3/C 750kcml, 5kV   Est   250   LF   33.60   0   reducted in 5 Conduit   0.69   173   173   WiRE	
Power Cables for MCC's   39L / 50kcmin, SRV   Est   250   LF   14.70   3,675   Routed in 3' Conduit   0.69   17/3   17	
Power Cables for MCC's   3/C 4/0/6/00Kmil, SkV   Est   0   LF   8.40   0   Routed in 2' Conduit   0.35   0   0   WIRE	
Power Cables from Switchgar to TR Sets   3/C #2/0, 600V   Est   0   LF   6.30   0   Conduit   0.52   0   0   WIRE   69.06   0	
Power Cables from MCC to Loads - 1 - 5HP   3/C #10, 600V   Est   300   LF   0.76   227   Routed in 3/4" Conduit   0.05   16   16   WIRE   69.06   1,098	
Power Cables from MCC to Loads - 1 ~ 5HP   3/C #10, 600V   Est   150   LF   1.58   236   Routed in 3/4" Conduit   0.05   6   8   WIRE   69.06   549	1,30
Power Cables from MCC to Loads - 15HP   3/C #6, 600V   Est   0   LF   2.12   0   Conduit   0.09   0   0   WIRE	80
Power Cables from MCC to Loads - 20 ~ 30 HP   3/C #4, 600V   Est   100	
Power Cables from MCC to Loads - 50HP   3/C #4, 600V   Est   100   LF   2.67   267   Conduit   0.35   35   35   WIRE	
Power Cables from MCC to Loads - 60HP   3/C #2, 600V   Est   50   LF   3.58   179   Routed in 2" Conduit   0.35   18   18   WIRE   69.06   1,209	
Control Cables - Pumps   5/C #14,600V   Est   300   LF   0.67   202 Routed in 3/4" Conduit   0.03   10   10   WIRE   69.06   663	1,40
Control Cables - TR Sets 7/C #14, 600V Est 0 LF 0.81 0 Conduit 0.04 0 0 WIRE 69.06 0 Instrumentation Cables 2 PR #16 SHLD Est 750 LF 0.25 189 Routed in 3/4" Conduit 0.03 24 24 WIRE 69.06 1,657 Data Highway Cable Est 1,000 LF 3.15 3,150 Routed in 3/4" Conduit 0.03 32 32 WIRE	90
Control Cables - TR Sets	<u> </u>
Instrumentation Cables	1,80
RACEWAY  3/4" Conduit  Est 2,500 LF 2.06 5,145 0.19 485 485 ECND  3/4" Conduit  1-1/2" Conduit  Est 100 LF 4.67 467 0.28 28 ECND  1-1/2" Conduit  Est 50 LF 6.25 312 0.35 18 18 ECND  2" Conduit  3" Conduit  Est 250 LF 13.13 3,281 0.65 161 161 ECND  3" Conduit	
Standard   Standard	
1-1/2" Conduit  Est 50 LF 6.25 312 0.35 18 18 ECND  2" Conduit 0.65 161 161 ECND  3" Conduit 113 0 0 ECND	
Fig. 2   Fig. 2   Fig. 3   F	
3" Conduit Est 250 LF 13.13 3,281 0.65 161 161 ECND 3" Conduit 113 0 0 ECND	
SOUNDING OF THE PROPERTY OF TH	

i.						Louis	ville Gas & E	lectric				T	1		<u> </u>		Estimate No.	- 21002B
	& Lundy <sup>LLC</sup>						lill Creek Uni										Project No.	
Chica	ago					SO3	Mitigation Sy	ystem										: 12/20/2005
<del></del>	Cost Type: Est = Estimated, Bid = Vendor quote			-		Option 2	Magnesium	Hydroxide							ļ		Rev Date	1/27/2006
	Oost Type. Lat - Latiniated, Did 2 Vendor quote					Order of N	lagnitude Co CONFIDENTIA	St Estimate	Wage Rates	Based on:			Louisville					: 1/27/2006
							ONTIDENTIA		Labor Prod				Louisville	1			Preparer: Reviewer:	
<u>Item No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man hours (Base)	Total Man- hours (Base)	Total Man- hours, Proc = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
AP-5	DCS SYSTEM ADDITIONS																	
71 -3	Cabinets		Est	1 1	EA	31,500.00	31,500		40.00	40	) 4	O EHEA						
AP-8	DCS PROGRAMMING/INTERFACE										. (	0						
	Interface Hardware		Est	1	EA	2,625.00		5	20.00	20	20	D EHEC	<u> </u>					
	Programming /Interface		Est	1	LT	5,250.00	5,250		0.00		)	WIRE	69.06	3 (	)			5,30
AP-9	LIGHTING ALLOWANCE		Est	1	LT	10,500.00	10,500		100.00	100	100	O INEL						•
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						689,199				2,615	5		80,761				709,20
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE																
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	5,250.00	5,250		1550.00	1,550	1,550	PNTR	55.58	86,149				91,40
MISC-2	ROADWORK	Not Required	Est	0	LS	36,750.00	0		380.00	0	(	PBIT	62.43	C	)			
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,90
MISC-4	OTHER																	22,50
	PUMP HOUSE 15' X 20'	INCLUDES EXCAVATION &													-			
	FOUNDATIONS	BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,20
	PREFAB BLDG.		Est	1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,20
MISC-5	CFD MODEL STUDY		Est	1	LS	100,000.00	100,000		40.00	40	40	STST	86.46	3,458				103,50
MISC-6	TANK BERM		Est	1	LS	76,000.00	76,000		260.00	260	260	STST	86.46	22,480				98,50
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	26,000.00	26,000		60.00	60	60	STST	86.46	5,188				31,20
MISC-5	MISC. SUBTOTAL						54,538				2,155			122,239				176,700
	·																	
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000	-			100,000
3r	GENERAL SUPPORT SUBTOTAL						0		>		0			100,000				100,00
	SUBTOTAL					:	2,051,379			0	47,514			3,297,288				5,287,80
	Craft Support During Startup	At 3% of Total Manhours				у <u></u>					1 405	MECH	66.86	95,303				95,300

							ville Gas & E										Estimate No.	: 21992B
Sargent	& Lundy <sup>LLC</sup>					M	lill Creek Uni	t 4									Project No.	: 10584-022
Chica	ago					SO3	Mitigation S	ystem									Date	: 12/20/2005
							- Magnesium					1	1:				Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote		<del> </del>		<b>-</b>		lagnitude Co				<del> </del>		+				<del></del>	: 1/27/2006
	oost Type. Lat a Cathilated, Did a Vendor quote				-		CONFIDENTIA						<u> </u>	1				
						-0	ONFIDENTI	4L-	Wage Rates		-		Louisville	e, KY			Preparer	
									Labor Produ	uctivity =					:		Reviewer	
Item No.	. <u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	Total Projected Cos
	Allowance for Premium Time Labor																	Not Included
	Productivity Loss Due To Overtime											<del> </del>	1				l	Not included
	Per Diem Expense				<b></b>		<b>-</b>		<del></del>	1			<del> </del>					Not Included
	Project Wrap (Efficacy) Insurance	· · · · · · · · · · · · · · · · · · ·		<del></del>	1		1			1			1				ļ	Not Included
***************************************	Erection Contractor's General & Administrative	At 5% of Material and Labor										<b> </b>	<b>†</b>					Trot molados
	Costs	Costs																264,40
	Erection Contractor's Profit	At 8% of Material and Labor Costs																423,00
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																Included w\Equipment Costs Included w\Equipment
	Special Tools	Included w\Equipment Costs			1													Costs
	Consumables	At 0.5% of Equipment/Material Cost At 4.5% of												3				10,30
	Freight To Site	Equipment/Material Cost		1						İ			l					92.30
	Taxes - Sales/Use/VAT/Business/Etc.			1									1					Not Included
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
	SUBTOTAL INSTALLED COST							:		0	48,939			3,392,592				6,173,10
ENGINE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team		<b></b>					-				<b>-</b>			-		617,30
PERMITT	TING, MODELING, ETC.	i diffished by Project realif	<b></b>	<del> </del>	1								1					017,30
STARTU	P, TESTING AND REAGENT (15 DAYS)			<b>1</b>	1					0			<del>                                     </del>					50,00
CONTING	GENCY	At 20% of Total	l	<del> </del>						0	· · · · · · · · · · · · · · · · · · ·		<b>I</b>					1,368,10
	NTERNAL COST	To Be Furnished by Owner	<u> </u>						<b>1</b> .	0			<b>1</b>					100,000
SPARE F	PARTS									0			1					Not Included
ESCALA		Not Included		1	1													1
	T DURING CONSTRUCTION (AFUDC)	Not Included																
	PROJECT TOTAL :				<b>_</b>				ļ				ļ	:		· · · · · · · · · · · · · · · · · · ·		9 200 50
	ILUOUEGE LOTAL!	ĺ	1	1	I		I .		1	ı U		Î .			ŀ	l	1	8,308,50

						Louis	ville Gas & E	lectric	T	T	T	1	T		Transition in the second			T
Sargent	t & Lundy <sup>LLC</sup>				<del> </del>		lill Creek Uni				-		<del> </del>		-		Estimate No.	
Chic			1		1	· · · · · · · · · · · · · · · · · · ·	Mitigation S				<u> </u>						<u> </u>	: 10584-022
}							tion 3 - Soda						-				<del></del>	: 12/20/2005
1	Cost Type: Est = Estimated, Bid = Vendor quote				1	<del></del>	lagnitude Co			-	-	1					<del></del>	1/27/2006
					<b> </b>		ONFIDENTIA		Wage Rates	Rased on:			Louisville					: 1/27/2006
									Labor Prode			<del> </del>	Louisviii	1	4		Preparer Reviewer	
																	Tieviewei	•
Item No	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	Total Projected Cos
	DUCTWORK MODIFICATIONS									1								
DW-1	MODIFY GAS DUCT TO ACCEPT INJECTION NOZZLES  DUCTWORK MODS		Est			0.005.00												
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	TN SF	2,625.00 8.40	2,625 1,680		35.00 0.27		35	FLDU	89.66 59.32				1	5,800
DW-4	DI ICTWORK SUPPORT OTRUGTURES					1	1,000		0.27	1 34	34	פאוט	59.32	3,203				4,900
DVV-4	DUCTWORK SUPPORT STRUCTURES STRUCTURAL STEEL		Eat -	E		1 000 55												
	ACCESS & GALLERIES		Est Est	5 400	TN SF	1,890.00 31.50	9,450 12,600	Ē	16.00 0.40		80	STST GALL	86.46 71.2					16,400
					<u> </u>	10	12,000		0.40	100	160	GALL	/1.2	11,392				24,000
DW-9	DUCTWORK SUBTOTAL						26,355				329			24,650				51,100
										<b> </b>								
	Injection System										:							
lc ,	EQUIPMENT/COMPONENTS																	
	Process Technology Package (PTP) by URS	4 - CS internals - 2.0 HP / 4 -	Est	1	EA	1,800,000.00	1,800,000		100.00	100	100	PUMP	65.83	6,583				1,806,600
	Pumps (6 Qty) Long-Term Storage Silo - Common for 2 Units (10	SS internals - 1.0 HP 420,250 lb full - 5,180 ft <sup>3</sup> -	Est	6	EA	2,100.00	12,600		20.00	120	120	PUMP	65.83	7,900		-		20,500
	1 5	D=17.6' - H=21.2' - SS 309,312 lb full - 4,957 ft <sup>3</sup> -	Est	1	EA	133,000.00	133,000	· · · · · · · · · · · · · · · · · · ·	535.21	535	535	TANK	65.78	35,206				168,200
	Soft H₂O Storage Tank - 1 Unit - (24 Hours)	D=18.48' - H=18.48' - CS	Est	1	EA	83,000.00	83,000		489.52	400	400	TANK	CF 70	00.004			70.0	
	Agitator (1 Qty)	SS Shaft - 20 HP	Est	1	EA	21,000.00	21,000		30.00	490 30		TANK MECH	65.78 66.86					115,200 23,000
	Air Compressors (2 Qty) Injection Manifold (2 Qty)	2 x 100% - 50 HP	Est	2	EA	21,000.00	42,000		80.00	160		MECH		10,698		·		52,700
	Dual Fluid Injection Nozzles (100 Qty)	Stainless Steel Stainless Steel	Est Est	2	EA LT	10,500.00 21,000.00	21,000 21,000		240.00	480	480	MECH MECH	66.86	32,093				53,100
	System Piping 6" - SS	L=250' - D=4" - SS / L=50' - D=4" - CS / L=50' - D=2" - SS							480.00	480		MECH		32,093	-			53,100
	6" - CS	Includes fitting allowance Includes fitting allowance	Est	250	LF LF	30.61	7,652		0.42	105		SPNG	70.4	7,392			-	15,000
	4" - SS	Includes fitting allowance	Est	50 50	LF	11.89	594		0.42			SPNG	70.4	1,478				2,100
	Piping Insulation & Lagging	moraces many anowance	Est Est	50 350	LF LF	24.89 9.14	1,244 3,197		0.33 0.17	17 60		SPNG	70.4	1,162		***************************************		2,400
	Heat Tracing		Est	350	LF	21.00	7,350		0.17		109	INSUL WIRE	53.39 69.06	3,177 7,493				6,400 14,800
		Allowance	Est	1	LS	2,520.00	2,520		48.00			SPNG	70.4	3,379				5,900
	Supply Piping Water Supply	Allowance	Ect			040.00										~~~~		
	Air Supply	Allowance	Est Est	1	LS LS	840.00 525.00	840 525		100.00	100		SPNG	70.4	7,040				7,900
	Piping Supports	Allowance	Est	<del>-  </del>	LS	2,940.00	2,940		80.00 112.00	80 112		SPNG SPNG	70.4 70.4	5,632 7,885				6,200
	Piping Rack	Allowance	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				10,800 35,800
S-2		INCLUDES EXCAVATION & BACKFILL	Est	75	$\sim$ $\sim$	4	44.545											
		DAONI ILL		75	CY	157.50	11,813		7.00	525	525	CONP	52.91	27,778				39,600
-	STRUCTURAL STEEL		Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
	AUGER CAST PILES (125 TON CAPACITY)	100 ft LONG	Est	0	LF	10.00	0		0.52	0	0	PILE	82.81	0				0
S-3	ROYALTY FEE	0	Est	0	LF									0				
																		<u> </u>

						Louis	ville Gas & I	Electric	1.	T		T	T .		· .		Estimate No.	21993B
	nt & Lundy <sup>LLC</sup>						ill Creek Un		1			<u> </u>	<u> </u>				Project No.	
Ch	icago						Mitigation S		1									<del> </del>
1			1		<u> </u>		tion 3 - Soda			-			<u> </u>		-			12/20/2005
Market	Cost Type: Est = Estimated, Bid = Vendor quote		<del> </del>							-		ļ	<b></b>				Rev Date	
			-	<del> </del>	-		lagnitude Co										Run Date	1/27/2006
			<del> </del>	<del> </del>	<del> </del>	-(	CONFIDENTI	AL-	Wage Rates			ļ	Louisville	e, KY	ļ:		Preparer	
							<u> </u>		Labor Produ	uctivity =	1		1				Reviewer	
											<u> </u>							
<u>item N</u>	lo. <u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
IS-4	IS SYSTEM SUBTOTAL						2,216,275				3,890			258,861				2,475,10
	MATERIAL UNI CARING OVOTEN										0,000			200,001				2,470,10
	MATERIAL UNLOADING SYSTEM																	
ASH-1	TRUCK UNLOADING SYSTEM		Est	1	Set	105,000.00	105,000		1254.00	1,254	1,254	SPNG	70.4	88,282				193,30
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL		<b> </b>	<b>_</b>			105,000		<b> </b>									
			-		<b> </b>		105,000				1,254			88,282		*****		193,30
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE																	
	SWITCHGEAR	Double Ended Unit Substation with (2) 1MVA, 6.9-480V XFMR's	Est	1	EA	460,000.00	460,000		500.00	500	500	EHEA	53.92	26,960				487,00
	New Breaker at Existing 13.2kV Switchgear		Est	1	EA	63,000.00	63,000		100.00	100	100	EHEA	53.92	5,392				68,40
	Misc Electrical Equipment & Controls		Est	2	EA	42,000.00	84,000		200.00	400		EHEA	53.92	21,568				105,60
-	imos Elsethodi Equipment & Obmios	<u> </u>	Est	1 1	LS	8,400.00	8,400		300.00	300	300	EHEA	53.92	16,176				24,60
<u>^</u>	GROUNDING																	
	Cable - 500kcmil GND		Est	2,000	LF	2.10	4,200		0.05	100	100	WIRE	69.06	6,906				11,10
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,40
AP-3	CABLE																	
MF-3	Power Cables for MCC's	3/C 750kcmil, 5kV																
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est Est	0 250	LF LF	33.60		Routed in 5" Conduit	0.69	0	0	WIRE	69.06	0				
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	14.70 8.40		Routed in 3" Conduit Routed in 2" Conduit	0.69 0.35	173		WIRE WIRE	69.06 69.06					15,60
						0.40		Routed in 1-1/2"	0.35	U	U	WIRE	09.00	0				
· · · · · · · · · · · · · · · · · · ·	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30	0	Conduit	0.52	o	O	WIRE	69.06	o				
	Power Cables from MCC to Loads - 1 ~ 5HP Power Cables from MCC to Loads - 15HP	3/C #10, 600V	Est	200	LF	0.76	151	Routed in 3/4" Conduit	0.05	11	11	WIRE	69.06					90
	i ower dables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	LF	1.58		Routed in 3/4" Conduit	0.05	0	0	WIRE	69.06	0				
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	50	LF	2.12	106	Routed in 1-1/2" Conduit Routed in 1-1/2"	0.09	5	5	WIRE	69.06	311				40
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V	Est	100	LF	2.67		Conduit	0.35	35	35	WIRE	69.06	2,417	ŀ			0.70
	Power Cables from MCC to Loads - 60HP	3/C #2, 600V	Est	0	LF	3.58		Routed in 2" Conduit	0.35	0		WIRE	69.06	2,417 N				2,70
	Control Cables - Pumps	5/C #14, 600V	Est	175	LF	0.67		Routed in 3/4" Conduit	0.03	6		WIRE	69.06	387			***************************************	50
	Control Cables - TR Sets	7/C #14, 600V	<b>-</b> ,	_	,			Routed in 1-1/2"								***************************************		
-	Instrumentation Cables	2 PR #16 SHLD	Est Est	750	LF LF	0.81 0.25		Conduit	0.04	0		WIRE	69.06	0				
	Data Highway Cable		Est	1,000	LF	3.15		Routed in 3/4" Conduit Routed in 3/4" Conduit	0.03 0.03	24 32		WIRE WIRE	69.06 69.06	1,657 2,210				1,80 5,40
				.,		0.10	5,150		0.03	32	32	WINE	09.00	2,210				5,40
P-4	RACEWAY																	****
	3/4" Conduit 1-1/2" Conduit		Est	2,125	LF	2.06	4,373		0.19	412		ECND	49.67	20,477				24,80
	2" Conduit		Est Est	150	LF LF	4.67	701		0.28	43	43	ECND	49.67	2,116				2,800
***************************************	3" Conduit		Est Est	0 250	LF LF	6.25 13.13	3,281		0.35	161		ECND	49.67	0 000				44.55
	5" Conduit		Est	0	LF	38.33	ع, <u>ح</u> و ا		0.65 1.13	161 0		ECND ECND	49.67 49.67	8,009 0				11,30
	DCS SYSTEM ADDITIONS																	
	Cabinets		Est		EA	31,500.00	31,500		40.00									
			LOI			31,300.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,70
P-8	DCS PROGRAMMING/INTERFACE																1	

						Louis	ville Gas & E	lectric	1						T		Stimate No.:	21003B
	& Lundy <sup>LLC</sup>						ill Creek Uni										Project No.:	
Chic	ago						Mitigation Sy											12/20/2005
	Cont Time. Set. Setimeted Bid. Made				-		tion 3 - Soda										Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote				-		agnitude Co										Run Date:	1/27/2006
					<u> </u>	-0	ONFIDENTIA	AL-	Wage Rates Labor Produ				Louisville	e, KY	V.		Preparer:	
									Labor Prouc	Citvity =							Reviewer:	
<u>Item No</u>	. <u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
	Interfere Headures																	
	Interface Hardware Programming /Interface		Est Est	1 1	EA LT	2,625.00 5,250.00	2,625 5,250		20.00		20	EHEC	59.36					3,800
					<u>                                     </u>	5,250.00	5,250		0.00		0	WIRE	69.06	0				5,300
AP-9	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,800
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						693,130				2,558			143,552				836,900
	REINFORCING OF EXISTING EQUIPMENT	NONE									2,000			. 10,002				200,300
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE															i.	
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,675.00	3,675		1250.00	1,250	1,250	PNTR	55.58	69,475				73,200
-2	ROADWORK		Est	0	LS	36,750.00	0		380.00	0	0	PBIT	62.43	0				(
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4	OTHER																	
	PUMP HOUSE 15' X 20'													•				
IS-2	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,200
	PREFAB BLDG.		Est	1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,200
MISC-5	CFD MODEL STUDY		Est	1	LS	0.00	0		40.00	40	40	STST	86.46	3,458				3,500
MISC-6	TANK BERM		Est	1	LS	62,000.00	62,000		260.00	260	260	STST	86.46	22,480	`			84,500
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	16,000.00	16,000		60.00	60	60	STST	86.46	5,188				21,200
MISC-5	MISC. SUBTOTAL						130,963				2,215			136,691				267,700
	CENEDAL CUDDODT																	
	GENERAL SUPPORT																	
	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,000
	SUBTOTAL						3,171,723			0	10,247			752,036				3,924,100
	Craft Support During Startup Allowance for Premium Time Labor	At 3% of Total Manhours	***************************************								307	MECH	66.86	20,553				20,600
	Productivity Loss Due To Overtime																	Not Included Not Included
	Per Diem Expense Project Wrap (Efficacy) Insurance					:												Not Included Not Included

						Louis	ville Gas & E	lectric									Estimate No	.: 21993B
	Lundy <sup>LLC</sup>	2				N	ill Creek Uni	t 4									Project No	.: 10584-022
Chica	jo					SO3	Mitigation Sy	/stem	-								Date	e: 12/20/2005
							tion 3 - Soda						<u> </u>				<del></del>	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote				1		lagnitude Co		<b>-</b>				<del> </del>				<b></b>	: 1/27/2006
				-	<del> </del>		ONFIDENTIA		Wage Rates	Pacad an			Louisville	LV.			<del></del>	
	·		<del> </del>	<del> </del>	-		ON IDENTIF	<b>\L</b> -	Labor Produ		<del>                                     </del>	<del> </del>	Louisville	, K r			Preparei	
									Labor Frodu	Cuvity =							Reviewe	1
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
	Erection Contractor's General & Administrative	At 5% of Material and Labor																
	Costs	Costs																196,200
	Erection Contractor's Profit	At 8% of Material and Labor Costs					-X-W-1					:						313,900
				<del>-  </del>	ļ												<b>-</b>	Included
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																w\Equipment Costs
	Special Tools	Included w\Equipment Costs																Included w\Equipment
	5500111000	At 0.5% of																Costs
	Consumables	Equipment/Material Cost																15,900
		At 4.5% of																10,500
	Freight To Site	Equipment/Material Cost																142,700
	Faxes - Sales/Use/VAT/Business/Etc. Construction Utilities (Elect, Water, etc.) During			<u> </u>	ļ:				<u> </u>									Not Included
	Construction	Furnished by Owner							-			: -						By Owner
	SUBTOTAL INSTALLED COST										10,554			772,588	***************************************			4,613,400
							:				10,001			112,000				4,010,400
ENGINEER	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team								0								461,300
	NG, MODELING, ETC.									0								0
CONTINGE	TESTING AND REAGENT (15 DAYS)	At CORV. of Tatal		<u> </u>						0								50,000
	TERNAL COST	At 20% of Total		<b> </b>					1	0								1,024,900
SPARE PA		Furnished by Owner		<u> </u>	<b></b>			· · · · · · · · · · · · · · · · · · ·		0								100,000
ESCALATI		Not Included		<b>-</b>						- 0								Not Included
	DURING CONSTRUCTION (AFUDC)	Not included																0
<del></del>	PROJECT TOTAL:	· · · · · · · · · · · · · · · · · · ·				-												
	HOULUI IVIAL.		<u> </u>	1	L				<u> </u>	U						-		6,249,600

						Louis	ville Gas & E	lectric	:			-	,	l :			stimate No.	: 21994B
Sargent &	Lundy <sup>LLC</sup>					N	ill Creek Uni	t 4	****								Project No.	: 10584-022
Chica						SO3	Mitigation Sy	/stem									Date	: 12/20/2005
						Option 4 -	Sodium Bisu	ulfite (SBS)									Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate									Run Date	: 1/27/2006
							ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer	:
					-		Ī		Labor Produ	uctivity =			†	i	<b>1</b>		Reviewer	<u> </u>
																		1
<u>ltem No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> <u>Equipment or</u> <u>Material Cost</u>	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Co
	DUCTWORK MODIFICATIONS																	
	MODIFY GAS DUCT TO ACCEPT INJECTION NOZZLES																	
	DUCTWORK MODS	0.1/0" INCL"	Est	1 200	TN	2,625.00	2,625 1,680		35.00	35	35	FLDU	89.66					5,80
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40	1,680		0.27	54	54	DINS	59.32	3,203			<u> </u>	4,90
DW-4	DUCTWORK SUPPORT STRUCTURES			<u> </u>								<b></b>	<del> </del>				<u> </u>	l
J11 4	STRUCTURAL STEEL		Est	5	TN	1,890.00	9,450		16.00	80	80	STST	86.46	6,917				16,40
	ACCESS & GALLERIES		Est	400	SF	31.50	12,600		0.40	160			71.2					24,00
									-				ļ					
DW-9	DUCTWORK SUBTOTAL						26,355				329			24,650				51,10
	Injection System							25.9	9									
	EQUIPMENT/COMPONENTS Process Technology Package (PTP). The cost	P&ID, Control Logic, Injection											<b> </b>					
	shown here is for a single skid shared by Unit 3 and 4.		Budget	1	EA	1,800,000.00	1,800,000		200.00	200	200	MISC	65.83	13,166				1,813,20
	Pumps (0 Qty), included in PTP	SS internals - 1.0 HP 60,000 gallon - D=16.5' -	Est	0	EA	2,100.00	0		20.00	0	0	PUMP	65.83	0				
	Long-Term Storage Silo -	H=23.1' - SS included in Soft Water supply	Est	1	EA	173,000.00	173,000		535.21	535		TANK	65.78					208,20
	Soft H₂O Storage Tank - 1 Unit - (24 Hours)	system	Est	0	EA	0.00	0		489.52	0	0	TANK	65.78	0				
	Agitator (1 Qty), included in PTP	SS Shaft - 20 HP	Est	3	EA EA	0.00 275,000.00	825,000		30.00 80.00	0 240	0	MECH MECH	66.86 66.86					044.00
	Air Compressors (2operating+ 1 spare Qty) Injection Manifold (2 Qty), PTP	3 x 100% - 150 HP Stainless Steel	Est Est	0	EA	0.00			240.00	240	240	MECH	66.86			,		841,00
	Dual Fluid Injection Nozzles (0 Qty), PTP	Stainless Steel	Est	Ö	LT.	0.00	Ö		480.00	Ö	0	MECH	66.86					
	System Piping 6" - SS	L=250' - D=4" - SS / L=50' - D=4" - CS / L=50' - D=2" - SS Includes fitting allowance	Est	250	LF	30.61	7,652		0.42	105	105	SPNG	70.4	7,392				15,00
	6" - CS	Includes fitting allowance	Est	50	LF	11.89			0.42	21		SPNG	70.4	1,478				2,10
	4" - SS	Includes fitting allowance	Est	50	LF	24.89			0.33	17		SPNG	70.4	1,162				2,40
	Piping Insulation & Lagging	g anonano	Est	350	LF	9.14	3,197		0.17	60	60	INSUL	53.39	3,177				6,40
	Heat Tracing		Est	350	LF	21.00	7,350		0.31	109	109	WIRE	69.06	7,493				14,80
	Valves	Allowance	Est	1	LS	2,520.00	2,520		48.00	48	48	SPNG	70.4	3,379				5,90
	Supply Piping								100.00			00000						
	Water Supply	Allowance	Est	1 1	LS	840.00	840		100.00	100		SPNG	70.4	7,040				7,90
	Air Supply	Allowance	Est	1 1	LS	525.00	525 2,940		80.00	80 112	80	SPNG SPNG	70.4	5,632 7,885				6,20
	Piping Supports	Allowance	Est Est	10	LS TN	2,940.00 2,200.00	2,940		112.00 16.00	112 160	112 160	STST	70.4 86.46					10,80 35,80
۶	Piping Rack FOUNDATIONS	Allowance INCLUDES EXCAVATION & BACKFILL	Est	90	CY	157.50	14,175		7.00	630	630		52.91	33,333				35,80 47,50
ხ-ა	STRUCTURAL STEEL	Allowance	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,80
IS-3	AUGER CAST PILES (125 TON CAPACITY)	100 ft LONG	Est	2,200	LF	10.00	22,000		0.52	1,144	1,144	PILE	82.81	94,735				116,70

				Ī		Louis	ville Gas & E	lectric						T			stimate No.	21994B
Sargant	& Lundy <sup>LLC</sup>						ill Creek Uni					-					Project No.	1
Chica					-		Mitigation Sy										<del> </del>	12/20/2005
' illica							Sodium Bisu		1				-				<del> </del>	1/27/2006
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	Cost Type: Est = Estimated, Bid = Vendor quote				-		agnitude Co			<u> </u>		ļ	ļ	1.00			<del> </del>	1/27/2006
						-0	ONFIDENTIA	\L-	Wage Rates				Louisville	, KY	<u> </u>		Preparer	
<u> </u>									Labor Produ	ctivity =		ļ	1		<b> </b>		Reviewer	:
ļ																		
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	Total Projected Cos
		Not Included, \$ per MW, to be											1	:				
IS-4	ROYALTY FEE	negotiated with Vendor	Est	0	LF									0				
IS-5	IS SYSTEM SUBTOTAL					_	2,905,038				3,720			264,791				3,169,70
1	MATERIAL UNLOADING SYSTEM								ļ						<u> </u>			
					<u> </u>	405.000.00	105 000		105100	4.054	4.054	CDNO	70.4	00.000				
ASH-1	TRUCK UNLOADING SYSTEM		Est	1 1	Set	105,000.00	105,000		1254.00	1,254	1,254	SPNG	70.4	88,282	<b> </b>			193,30
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL			<b> </b>			105,000		1		1,254			88,282				193,30
7	MATERIAL ONLOADING OTOTEM CODIOTAL																	
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE				<u> </u>													
	SWITCHGEAR New Breaker at Existing 13.2kV Switchgear MCC Misc Electrical Equipment & Controls	Double Ended Unit Substation with (2) 1 MVA, 6.9-480V XFMR's	Est Est Est Est	1 1 2	EA EA EA LS	460,000.00 63,000.00 42,000.00 8,400.00	63,000 84,000		500.00 100.00 200.00 300.00	500 100 400 300	100 400	EHEA	53.92 53.92 53.92 53.92	26,960 5,392 21,568 16,176				487,00 68,40 105,60 24,60
	Mico Elocatora Equipition a Controlo									***************************************								
AP-2	GROUNDING																	
	Cable - 500kcmil GND		Est	2,000	LF	2.10			0.05	100			69.06	6,906				11,10
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,40
AP-3	CABLE			<b> </b>					l									
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60	0	Routed in 5" Conduit	0.69	0	0	WIRE	69.06	0				(
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.70	3,675	Routed in 3" Conduit	0.69	173	173	WIRE	69.06	11,913				15,600
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.40		Routed in 2" Conduit Routed in 1-1/2"	0.35	0	0	WIRE	69.06					
	Power Cables from Switchgear to TR Sets Power Cables from MCC to Loads - 1 ~ 5HP	3/C #2/0, 600V 3/C #10, 600V	Est Est	0 200	LF LF	6.30 0.76		Conduit Routed in 3/4" Conduit	0.52 0.05	11	11	WIRE	69.06 69.06	732				90
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #8, 600V	Est	0	LF	1.58		Routed in 3/4" Conduit	0.05	0	0	WIRE	69.06	0				30
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	50	LF	2.12		Routed in 1-1/2" Conduit Routed in 1-1/2"	0.09	5	5	WIRE	69.06	311				40
	Power Cobles from MCC to London 50115	3/C #4, 600V	Est	100	LF	2.67	267	Conduit	0.35	35	35	WIRE	69.06	2,417				2,700
	Power Cables from MCC to Loads - 50HP Power Cables from MCC to Loads - 150HP	3/C #4, 600V 3/C 250kcmil, 600V	Est	100	LF	1,980.00		Routed in 3" Conduit	0.35	35	35	WIRE	69.06					200,400
	Control Cables - Pumps	5/C #14, 600V	Est	175	LF	0.67	118	Routed in 3/4" Conduit	0.03	6	6	WIRE	69.06					500
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81	0	Routed in 1-1/2" Conduit	0.04	0		WIRE	69.06	0				(
	Instrumentation Cables Data Highway Cable	2 PR #16 SHLD	Est Est	750 900	LF LF	0.25 3.15		Routed in 3/4" Conduit Routed in 3/4" Conduit	0.03 0.03	24 29	24	WIRE WIRE	69.06 69.06	1,657 1,989				1,800 4,800
AP-4	RACEWAY		p=	0.005		0.00	4 400		0.40	200	200	ECNID	40.67	10.510		·		00.70
	3/4" Conduit		Est	2,025	LF LF	2.06 4.67			0.19 0.28	393 43	393	ECND ECND	49.67 49.67	19,513 2,116				23,700 2,800
	1-1/2" Conduit 2" Conduit		Est Est	150 100	LF LF	6.25		· ·	0.26	35	35	ECND	49.67	1,748				2,800
	3" Conduit		Est	250	LF	13.13	3,281		0.65	161	161	ECND	49.67	8,009				11,300
	5" Conduit		Est	0	LF	38.33	0		1.13	0	0	ECND	49.67	0				(
			1												'			
AP-5	DCS SYSTEM ADDITIONS				1				ll		I							

- T			- According			Louis	ville Gas & E	lectric								1	stimate No.:	21994B
Sargent 9	Lundy <sup>LLC</sup>						ill Creek Unit										Project No.:	
cag							Mitigation Sy			<b> </b>			ļ				<del> </del>	12/20/2005
T							Sodium Bisu		<del>                                     </del>			<u> </u>	-				<del> </del>	1/27/2006
C	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co		Wage Rates	Based on:			Louisville	e. KY			Preparer:	<del> </del>
							ONIDENTIA		Labor Produ		·		-	1	;		Reviewer:	<del> </del>
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Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
			Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157	<del></del>			33,700
	Cabinets		LSI	'														
AP-8	DCS PROGRAMMING/INTERFACE		Est		EA	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187				3,800
	Interface Hardware Programming /Interface		Est	1	LT	5,250.00			0.00		0	WIRE	69.06	0				5,300
			Est	-	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,800
AP-9	LIGHTING ALLOWANCE		Est			10,700.00												
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						891,234				2,606			146,533				1,038,000
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE							<b>_</b>									
		NONE			-	<u> </u>												
	MISCELLANEOUS	NONE																
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,675.00			1250.00	1,250	1,250	PNTR	55.58 62.43					73,200
MISC-2	ROADWORK		Est	0	LS	36,750.00	0		380.00		U *	PBIT		0				U
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4	OTHER																	
-					1													
	PUMP HOUSE 15' X 20'								100.00	100	100	CTCT	06.46	11.040				40.000
<u></u>	PREFAB BLDG.	INOLLIDES EVOAVATION 9		1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,200
	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	25	CY	157.50	3,938		7.00	175		CONP	52.91					13,200
MISC-5	CFD Model Study	included in PTP	Est		1 LS	0.00	0		40.00	40	40	STST	86.46	3,458				3,500
	Berm around Tanks	60,000 gallon tank, 12" concrete wall, 6" slab, sump, for 110% containment (40' x 40' x 6' high)	Est		1 LS	74,000.0			260.00			STST	86.46					96,500
MISC-7	Soft Water Supply System	50 gpm capacity	Est		1 LS	50,000.0	50,000		60.00	60	60	STST	86.46	5,188				55,200
	CFD MODEL STUDY		Est	1	LS	0.0	0		40.00	40	40	STST	86.46	3,458				3,500
	TANK BERM		Est	1	LS	74,000.0	74,000		260.00	260	260	STST	86.46	22,480				96,500
			Est	1	LS	28,000.0	28,000		60.00	60	60	STST	86.46	5,188				33,200
MISC-7	SOFT WATER SUPPLY SYSTEM		LSI		1													
	GENERAL SUPPORT																	
			Est	1	LT		- 0					<u> </u>		100,000				100,000
GS-1	MOBILIZATION / DEMOBILIZATION		Lot															g+ 40 g

							ville Gas & E									1	Estimate No	.: 21994B
Sargent &	& Lundy <sup>LLC</sup>		:			M	ill Creek Uni	t 4									Project No	.: 10584-022
^hica	go					SO3	Mitigation Sy	vstem									Date	e: 12/20/2005
					1		Sodium Bisi								1		Rev Date	1/27/2006
_	Control Edit Fall and Bld Vandarania			+	-		agnitude Co				<del> </del>		<del> </del>					e: 1/27/2006
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					<del> </del>		ONFIDENTIA	4L-	Wage Rates		<u> </u>	<u> </u>	Louisville	, KY	<b>]</b>		Prepare	
				<del> </del>	-				Labor Produ	ctivity =			] ]		<u> </u>		Reviewe	-
<u>Item No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
														100,000		-		100.00
GS-2	GENERAL SUPPORT SUBTOTAL			<b>I</b>			ļ				<u>'</u>		ļ	100,000			<u> </u>	100,00
	SUBTOTAL			l	<b>-</b>		4,206,589		-	0	10,484			792,073			<u> </u>	4,999,00
	SUBTUTAL			1			.,200,000	-			1,,,,,,,			102,070			<b>1</b>	1,555,00
	Craft Support During Startup	At 3% of Total Manhours									315	MECH	66.86	21,028			Ī	21,00
	Allowance for Premium Time Labor	7.1.070011010110010															1	Not Included
	Productivity Loss Due To Overtime																	Not Included
	Per Diem Expense																	Not Included
	Project Wrap (Efficacy) Insurance																	Not Included
	Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs																250,00
	Erection Contractor's Profit	At 8% of Material and Labor Costs									-							399,90
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																Included w\Equipment Costs
:	Special Tools	Included w\Equipment Costs																Included w\Equipment Costs
_	Consumables	At 0.5% of Equipment/Material Cost																21,00
	Freight To Site	At 4.5% of Equipment/Material Cost																189,3
	Taxes - Sales/Use/VAT/Business/Etc.																	Not Included
	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
											40 700			646454				
	SUBTOTAL INSTALLED COST				-				I	0	10,798			813,101	1	<del></del>	<b></b>	5,880,20
ENGINE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team	,	1					1	0								588,00
DEDMITT	ING, MODELING, ETC.	armanea by r toject ream							1	Ö								1
	P, TESTING AND REAGENT (15 DAYS)				1				1	0								50,00
CONTING		At 20% of Total								O								1,303,60
CLIENT	NTERNAL COST	Furnished by Owner						***************************************		0								100,00
SPARE P										0								Not Included
ESCALAT		Not included																
INTERES	T DURING CONSTRUCTION (AFUDC)	Not Included																-
	PROJECT TOTAL :									0								7,921,80

						Louis	ville Gas & E	lectric									Estimate No.	21995B
	116						ill Creek Unit										Project No.	10584-022
	Lundy LLC					SO3	Mitigation Sy	stem									Date	12/20/2005
ica	go						ption 5 - Tro										Rev Date	1/27/2006
							agnitude Co										Run Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer	
									Labor Produ	ctivity =	·		1				Reviewer	
										<u>Total</u>				<u>Total</u>	Ch			
<u>ltem No.</u>	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
	DUCTWORK MODIFICATIONS										-							
									-									
	MODIFY GAS DUCT TO ACCEPT INJECTION																	
DW-1	NOZZLES DUCTWORK MODS		Est	1	TN	2,625.00	2,625		35.00	35	35	FLDU	89.66				-	5,80
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40	1,680		0.27	54	54	DINS	59.32	3,203			<del> </del>	4,90
					-													
DW-2	DUCTWORK SUPPORT STRUCTURES		Est	5	TN	1,890.00	9,450		16.00	80		STST	86.46					16,40
	STRUCTURAL STEEL ACCESS & GALLERIES		Est	400	SF	31.50			0.40	160	160	GALL	71.2	11,392			<u> </u>	24,00
	AUDESS & GALLETIES													<u> </u>			<b> </b>	
					1		26,355				329			24,650				51,10
DW-4	DUCTWORK SUBTOTAL																	
				<u> </u>	1												<u> </u>	
	Injection System		: .		* * · · · · · · · · · · · · · · · · · ·													
<u> </u>	EQUIPMENT/COMPONENTS						000 750		105.00	630	620	PUMP	65.83	41,473			<b>-</b>	372,20
	Air Blowers	150 hp each	Est	6	EA	55,125.00 10,500.00			30.00	90		TANK	65.78				<b>1</b>	37,40
	VFD Rotary Feeder	3 hp - Stainless Steel 2,687,900 lb full - 11,610 ft <sup>3</sup> -	Est	3	EA	10,500.00	31,000		1 00.00			······	l	1 3,320			1	
	Long-Term Storage Silo - Common for 2 Units (10	2,687,900 lb full - 11,610 lb - 10=20.7' - H=83.0' - CS Silo - SS			.	1000			1004.00	1,624	1.604	TANK	65.78	106,827			1	696,80
	Days), Unit cost is split between Units 3 and 4	Hopper	Est	1	EA	590,000.00	590,000		1624.00	1,024	1,024	IMIN	00.78	100,027			1	090,80
		268,800 lb full - 1,160 ft <sup>3</sup> -					ľ										1	1000
	Short-Term Storage Silo - (24 Hours)	D=8.7' - H=39.0' - CS Silo - SS Hopper	Est	1	EA	180,000.00	180,000		120.00		120	TANK MECH	65.78 66.86	7,894 32,093			<b> </b>	187,90 53,10
	Injection Manifold (2 Qty)	Stainless Steel	Est	2	EA	10,500.00 10,500.00	21,000		240.00 240.00	480 240		MECH					1	26,50
	Injection Nozzles (50 Qty)	Stainless Steel	Est	1	LT_	10,500.00	10,300		2-10.00	2-10				70,010				
	System Piping	Includes fitting allowance	Est	350	LF	18.4	6,468		0.46	160		SPNG	70.4					17,70
	8" - CS	includes naing allowance	Est	0	LF	6.62			0.14	0	0	INSUL	53.39					
	Piping Insulation & Lagging Heat Tracing		Est	0	LF	0.0			0.00	0		WIRE	69.06				1	
	Valves	Allowance	Est	1	LS	1,050.0	1,050		24.75	25	25	SPNG	70.4	1,742			1	2,80
	Supply Piping				1	840.0	1		100.00		<u></u>	SPNG	70.4	0			<del> </del>	
	Water Supply	Allowance	Est	0	LS	525.0			80.00	0	o o	SPNG	70.4					
	Air Supply	Allowance	Est Est	0	LS	1,575.0			60.00	60	60	SPNG	70.4	4,224				5,80
	Piping Supports	Allowance Allowance	Est	10	TN	2,200.0			16.00	160	160	STST	86.46					35,80
	Piping Rack	INCLUDES EXCAVATION &					]		7.00		600	CONP	52.91	33,333				47,50
IS-2	FOUNDATIONS	BACKFILL	Est	90	CY	157.5			7.00									
	STRUCTURAL STEEL		Est	10	TN	2,200.0	0 22,000		16.00	160	160	STST	86.46	13,834				35,80
		100 ft LONG	Est	2,200	- LF	10.0	0 22,000		0.52	1,144	1,144	PILE	82.81	94,735				116,70
IS-3	AUGER CAST PILES (120 TON CAPACITY)	TOO IL LONG	Lot	2,200							5,522			383,190				1,636,00
IS-4	IS SYSTEM SUBTOTAL						1,253,018				3,322			303,130				1,000,00
	MATERIAL UNLOADING SYSTEM																	
<u> </u>			F-A		Set	105,000.0			1254.00	0	0	SPNG	70.4	0		:		
ASH-1	TRUCK UNLOADING SYSTEM	Included in silo	Est	0	Set	100,000.0	1	*										
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL						0	<u> </u>	1		0			0			<u> </u>	

. T						Louis	ville Gas & E	lectric								E	stimate No.	: 21995B
Sargent &	د Lundy <sup>LLC</sup>					M	ill Creek Uni	t <b>4</b>									Project No.	: 10584-022
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licaç	go				<u> </u>	1	ption 5 - Tro										Rev Date	1/27/2006
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	Cost Type: Est = Estimated, Bid = Vendor quote			<u> </u>			ONFIDENTIA		Wage Rates	Pacad on:			Louisville	KV			Preparer	ļ
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1 1	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AD 1	POWER SOURCE			<u> </u>														
AP-1	FOWER SOURCE	Double Ended Unit Substation with (2) 1MVA,							500.0-				50.00	00.000				107.00
	480V SWITCHGEAR	6.9-480V XFMR's	Est	1 1	EA	460,000.00			500.00 100.00	500 100	500 100	EHEA EHEA	53.92 53.92	26,960 5,392				487,00 68,40
	New Breaker at Existing 4160V Switchgear		Est	1 1	EA EA	63,000.00 42,000.00	63,000 84,000		200.00	400	400		53.92 53.92					105,60
	MCC		Est Est	2	LS	60,900.00	60,900		300.00	300	300	EHEA	53.92					77,10
	Misc Electrical Equipment & Controls		ESI			00,900.00	50,500		000.00									1.,,,
	GROUNDING		Fat	2,000	LF	2.10	4,200		0.05	100	100	WIRE	69.06	6,906				11,10
	Cable - 500kcmil GND		Est Est	12	EA	199.50	2,394		4.00	48	48	PILE	82.81	3,975				6,40
	Grounding Rod		ESI	12	L-~	199.50	2,034		1.00					5,2.0				5, 10
1-1	CABLE										:							
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60		Routed in 5" Conduit	0.69	0		WIRE	69.06	0				1
	Power Cables for MCC's	3/C 500kcmil, 600kV	Est	250	LF	14.70		Routed in 3" Conduit	0.69	173	173	WIRE	69.06					15,60
	Power Cables for 480V Switchgear	3/C 4/0kcmil, 5kV	Est	250	LF	8.40		Routed in 2" Conduit Routed in 1-1/2"	0.35	88	88	WIRE	69.06	6,043	-			8,10
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	10	LF	6.30	0	Conduit	0.52	0	0	WIRE	69.06	0				
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	150	LF	0.76		Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549				70
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	. LF	1.58		Routed in 3/4" Conduit	0.05	0	0	WIRE	69.06	0				
	Power Cables from MCC to Loads - 50 HP	3/C #4, 600V	Est	150	LF	2.10	315	Routed in 1-1/2" Conduit Routed in 1-1/2"	0.09	14	14	WIRE	69.06	932				1,20
	Dawer Cables from MCC to Loads 100UD	3/C #4/0, 600V	Est	150	LF	9.45		Conduit	0.50	75	75	WIRE	69.06	5,180				6,60
<b></b>	Power Cables from MCC to Loads - 100HP Power Cables from MCC to Loads - 150HP	3/C #4/0, 600V	Est	300	T LF	10.50	3,150	Routed in 2" Conduit	0.69	207	207	WIRE	69.06	14,295				17,40
	Control Cables - Pumps	5/C #14, 600V	Est	150	LF	0.67		Routed in 3/4" Conduit	0.03	5	5	WIRE	69.06	332				400
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81		Routed in 1-1/2"	0.04	0		WIRE	69.06	0				
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25		Routed in 3/4" Conduit	0.03	24	24	WIRE	69.06	1,657				1,800
	Data Highway Cable		Est	1,000	LF	3.15	3,150	Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210				5,400
<u> </u>	DACEWAY		1															1
	RACEWAY 3/4" Conduit		Est	2,300	LF	2.06	4,733		0.19	446	446	ECND	49.67	22,163				26,90
	1-1/2" Conduit		Est	300	LF	4.67	1,402		0.28	85	. 85	ECND	49.67	4,232				5,600
	2" Conduit		Est	550	LF	6.25	3,436		0.35	194	194	ECND	49.67	9,616				13,100
	3" Conduit		Est	900	LF	13.13			0.65	581		ECND	49.67	28,833				40,600
	5" Conduit		Est	0	LF	38.33	0		1.13	0	0	ECND	49.67	0				1
100	DOG OVOTEM ADDITIONS				<u> </u>													<u> </u>
	DCS SYSTEM ADDITIONS Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,700
	DCS PROGRAMMING/INTERFACE		<del> </del>	<del>                                     </del>	EA	2,625.00	2,625	Western Committee of the Committee of th	20.00	20	20	EHEC	59.36	1,187				3,800
	Interface Hardware		Est Est	1 1	LT	5,250.00	5,250		0.00	0		WIRE	69.06	0				5,300
	Programming /Interface																	
<u> </u>	LIGHTING ALLOWANCE		Est	1	LT	10,500.00	10,500		100.00	100	100	INEL	60.02	6,002				16,500
<u> </u>	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						759,964				3,538			198,278				958,300
							/60 06/1				3 5331			120.7701				

	T					Louis	ville Gas & E	lectric									Stimate No.:	21995B
Sargent 8	& Lundy <sup>LLC</sup>						ill Creek Uni										Project No.:	10584-022
hica	go						Mitigation Sy										4	12/20/2005
							ption 5 - Tro											1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate									Run Date:	<del></del>
						-C	ONFIDENTIA	\L-	Wage Rates				Louisville	, KY			Preparer:	<del> </del>
					<u> </u>				Labor Produ	ctivity =			1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
			-															
	REINFORCING OF EXISTING																	
	EQUIPMENT	NONE			<u> </u>													
	DEMOLITION / RELOCATIONS	NONE																
	MOOFILANGOUS	NONE												<u>}</u>				
-	MISCELLANEOUS	NONE			1												<b></b>	
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,150.00	3,150		1170.00	1,170	1,170	PNTR	55.58	65,029				68,20
					16	06.750.00			380.00			PBIT	62.43	0				
MISC-2	ROADWORK		Est	0	LS	36,750.00												
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,90
MISC-4	OTHER																	
<u> </u>	BLOWER HOUSE																	
	PREFAB BLDG (15' x 20' )			1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,20
	FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259	-			13,200
MISC-5	CFD MODEL STUDY		Est	1	LS	30,000.00	30,000		40.00	40	40	STST	86.46	3,458				33,500
MISC-6	TANK BERM		Est	1	LS	0.00	0		260.00	260	260	STST	86.46	22,480				22,500
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	0.00	0		60.00	60	60	STST	86.46	5,188				5,200
															<b> </b>			
MISC-5	MISC. SUBTOTAL						82,438				2,135			132,244				214,700
																		·
	GENERAL SUPPORT															······································		-
	GENERAL SUFFORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000				100,000
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,000
	SUBTOTAL						2,121,774			0	11,524			838,362			-	2,960,100
* -		At 00/ of Total Manhause		1							346	MECH	66.86	23,115				23,100
	Craft Support During Startup Allowance for Premium Time Labor	At 3% of Total Manhours			1.													Not Included
	Productivity Loss Due To Overtime																	Not Included Not Included
	Per Diem Expense Project Wrap (Efficacy) Insurance			<b> </b>	<b> </b>													Not Included
	Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs												·				148,000
	Erection Contractor's Profit	At 8% of Material and Labor																236,800
<u>-</u>	LISCHOIL COMMACIONS FIOR	Costs				4				<u> </u>								Included
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs											ļ.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					w\Equipment Costs

						Louis	ville Gas & E	lectric								Æ	stimate No.:	21995B
Sargent &	& Lundy <sup>LLC</sup>					M	ill Creek Uni	t 4									Project No.:	10584-022
ica						SO3	Mitigation Sy	/stem									Date:	12/20/2005
-					-		ption 5 - Tro				-						Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote			<u> </u>			lagnitude Co										Run Date:	1/27/2006
	Cost Type: Est = Estimated, Bid = Veridor quote						ONFIDENTIA		Wage Rates	Based on:			Louisville	KY			Preparer:	
Namanan watan da da da da da da da da da da da da da					<del> </del>		ONFIDENTIA	\L- 	Labor Produ				Louisviiis	1			Reviewer:	<u> </u>
;									Labor Frode	l l							neviewer.	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Co</u>
																:		Included
	Special Tools	Included w\Equipment Costs											-					w\Equipment Costs
		At 0.5% of							<b>.</b>			-				-		100
	Consumables	Equipment/Material Cost		<b> </b>														10,6
	Freight To Site	At 4.5% of Equipment/Material Cost														-		95,5
	Taxes - Sales/Use/VAT/Business/Etc.	Equipment/waterial Cost		1	-													Not Included
· · · · · · · · · · · · · · · · · · ·	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
············									ļ									
*****************	SUBTOTAL INSTALLED COST				-					0	11,870			861,477				3,474,1
FNGINE	I ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team								0								347,4
PERMITT	TING, MODELING, ETC.									0								
	P REAGENT TESTING (15 DAYS)									0								50,00
CONTING	GENCY	At 20% of Total			<u> </u>					0								774,30
ITI	NTERNAL COST	To Be Furnished by Owner		<u> </u>						0								100,00
	PARTS		-															Not Included
ESCALA <sup>*</sup>		Not Included		<b>_</b>			İ											
INTERES	T DURING CONSTRUCTION (AFUDC)	Not Included								-								<b> </b>
-	PROJECT TOTAL:		ļ	<del> </del>	1					0								4,745,80

						Louis	ville Gas & E	lectric		2.00			2. 2. 3.			E	stimate No.:	21997B
	uc					1	ill Creek Uni					-	\$ <del></del>				Project No.:	10584-022
	k Lundy <sup>LLC</sup>						Mitigation S					-	K <del></del>				Date:	12/20/2005
ica	go						Horizontal F					-	5 <u></u> 5 8				Rev Date	1/27/2006
<b></b>	a a a a a a a a a a a a a a a a a a a						agnitude Co						8 <del></del>				Run Date:	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						ONFIDENTIA		Wage Rates	Based on:			Louisville	e. KY	1		Preparer:	
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Item No.	<u>Description</u>	Scope Definition	Cost Type	<u>Quantity</u>	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	<u>Crew</u> <u>Code</u>	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cost</u>
												-			<u> </u>			8
	DUCTWORK MODIFICATIONS	COSTS					<u> </u>					-		ļ				
												1						
J	WESP & ASSOCIATED EQUIP																	
	WEST & ASSOCIATED EGOT											1						
	WILLIAM TO THE THE TAX TO THE TAX																	
WE-1	WESP (Two ESP boxes, with 29 feet three fields, 9 feet long 1st field at 9.75" spacing with 76 gas passages, and 11 feet long 2nd and 3rd fields at 11.75" spacing with 64 passages, total 170 SCA. All internal 2205, with 2205 carbon steel clad alloy plate construction)	INCLUDES ALL ASSOCIATED DUCTWORK AND WASTE WATER EQUIPMENT,PIPING AND TANKS	Est	1	EA	31,570,000.00	31,570,000	BUDGETARY INPUT FROM VENDOR	142817	142,817	<b>7</b> 142,817	PREC	86.72	12,385,047				43,955,000
	Chimney Lines Adjustment ( WITH MODIFIED	RETURN TO EXISTING																
WE-2	Chimney Liner Adjustment ( WITH MODIFIED BREECHING AT WESP OUTLET ELEVATION)	BREECHING	Est	0	LF	5,302.50	C	)	55	(	) C	PREC	86.72	0				0
VV E-2	BREECHING AT WEST COTLET ELEVATION)	5,12201																
1	Chimney Breaching Adjustment		Est	0	LS	21,000.00	0		220	(	)C	PREC	86.72	0		-		10
				1	EA	21,000.00	21,000	<u> </u>	100.00	100	100	STST	86.46	8,646				29,600
WE-4	Electrical Building	20'x40'	Est		EA	21,000.00	21,000		100.00		1		00.40	0,040				29,000
		INCLUDES EXCAVATION &															,	
WE-5	FOUNDATIONS	BACKFILL	Est	810	CY	157.50			7.00			CONP	52.91	300,000				427,600
WE-6	STRUCTURAL STEEL		Est	170	TN	2,200.00			16.00	2,720	2,720		86.46					609,200
WE-7	AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	2,000	LF LF	7,200.00			0.52 50.00	1,040 22,500	1,040	PILE DUCT	82.81 59.32	86,122 1,334,700				106,100 4,574,700
WE-7	FIBER GLASS DUCT 23' DIA		Est	450	LF	7,200.00	35,352,575	/	30.00	22,300	174,847	יייטטו	39.32	14,349,686				49,702,200
WE-8	WE SYSTEM SUBTOTAL			<b>†</b>			00,002,070				17 1,0 17			1 1,0 10,000				10,102,200
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE																	
		Double Ended Unit Substation with (2) 2MVA, 6.9- 480V XFMR's	Est	1	EA	575,000.00			500.00	500		EHEA:	53.92	26,960				602,000
-	SWITCHGEAR  New Breaker at Existing 13.2kV Switchgear	1.007.74.734.10	Est	1	EA	63,000.00	63,000	)	100.00	100	100	EHEA	53.92	5,392				68,400
	MCC		Est	2	EA	52,500.00			240.00	480 324	480	EHEA EHEA	53.92 53.92	25,882 17,470				130,900
	Misc Electrical Equipment & Controls		Est	1 1	LS	86,100.00	86,100	1	324.00	324	324	EMEA	53.92	17,470		<u> </u>		103,600
AP-2	GROUNDING									55555 A								
711 - 2	Cable - 500kcmil GND		Est	2,000	LF	2.10			0.05 4.00	100	100 48	WIRE PILE	69.06 82.81	6,906 3,975				11,100 6,400
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	40	48	FILE	02.81	3,975				6,400
45.5	I CARLE			<b>-</b>	1													
AP-3	CABLE Power Cables for MCC's	3/C 750kcmil, 5kV	Est	100	LF	33.60		Routed in 5" Conduit	0.69	69		WIRE	69.06	4,765				8,100
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	0	LF	14.70		Routed in 3" Conduit	0.69	0	<u> </u>	WIRE	69.06	0 1 171				0
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	1,000	LF_	8.40	8,400	Routed in 2" Conduit Routed in 1-1/2"	0.35	350	350	WIRE	69.06	24,171				32,600
		2/0 #2/0 600/	Est	2,400	LF	6.30	15.120	Conduit	0.52	1,248	1.248	WIRE	69.06	86,187			I	101,300
	Power Cables from Switchgear to TR Sets Power Cables from MCC to Loads - 1 ~ 5HP	3/C #2/0, 600V 3/C #10, 600V	Est	0	LF	0.76	6 0	Routed in 3/4" Conduit	0.05	, 0	0	WIRE	69.06	0				0
<b> </b>	Power Cables from MCC to Loads - 1 ~ 5HP  Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	1,500	LF	1.58		Routed in 3/4" Conduit	0.05	80	80	WIRE	69.06	5,490				7,900
						0.40		Routed in 1-1/2"	0.09		_	WIRE	69.06					ٳ
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	0	<u>  LF</u>	2.12	<u> </u>	Conduit	0.09	posessi U	<u> </u>	- YVIDE	09.00	<u> </u>	1			<u> </u>

						Louis	ville Gas & E	lectric								E	stimate No.:	21997B
Sargent &	Lundy <sup>LLC</sup>						ill Creek Uni						<u> </u>				Project No.:	10584-022
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	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co						8				Run Date:	1/27/2006
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									Labor Produ	ictivity =			3	1	ļ		Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	<u>Crew</u> <u>Code</u>	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
								Routed in 1-1/2"										
	Daway Cables from MCC to Leade FOUR	3/C #4, 600V	Est	0	LF	2.67	0	Conduit	0.35	l (		WIRE	69.06	. 0				
		3/C #2, 600V	Est	0	LF	3.58	0	Routed in 2" Conduit	0.35		) (	WIRE	69.06	0				
	Control Cables - Pumps	5/C #14, 600V	Est	1,500	LF	0.67	1,008	Routed in 3/4" Conduit	0.03	48	48		69.06	3,315				4,300
		7/0 #44 600\/	Est	2,400	LF	0.81	1 940	Routed in 1-1/2" Conduit	0.04	96	06	WIRE	69.06	6,630				0.600
	Control Cables - TR Sets Instrumentation Cables	7/C #14, 600V 2 PR #16 SHLD	Est	750	LF LF	0.81		Routed in 3/4" Conduit	0.04	24	24		69.06	1,657				8,600 1,800
	Instrumentation Cables  Data Highway Cable	2.11.1001120	Est	1,000	LF	3.15		Routed in 3/4" Conduit	0.03	32		WIRE	69.06					5,400
AP-4	RACEWAY											1						
	3/4" Conduit		Est	4,750	LF	2.06			0.19		922	ECND ECND	49.67					55,500
	1-1/2" Conduit		Est Est	2,400 1,000	LF LF	4.67 6.25	11,214 6,248		0.28 0.35	952	352	ECND	49.67 49.67					45,100 23,700
	2" Conduit 3" Conduit		Est	0	LF	13.13	0		0.65		000	ECND	49.67	0				23,700
-	5" Conduit		Est	100	LF	38.33			1.13	113	113		49.67	5,598				9,400
	DCS SYSTEM ADDITIONS				<u> </u>	04 500 00	04.500		40.00		40							
	Cabinets		Est	1 1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,700
AP-8	DCS PROGRAMMING/INTERFACE																	
	Interface Hardware		Est	1	EA	2,625.00			20.00	20	20	EHEC	59.36	1,187				3,800
	Programming /Interface		Est	1 1	LT	5,250.00	5,250		0.00	C	1	WIRE	69.06	0				5,300
AP-9	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,800
	EIGHTHIA ALLOWATOL																	
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						957,418				5,776			336,065				1,293,700
	DEINEODOINO OF EVICTINO				1													
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DELICALITICAL / DELICALITICALS	NONE		1	1													
	DEMOLITION / RELOCATIONS	NONE													-			
	MISCELLANEOUS	NONE																
MICC	DAINTING	Touch-up and Field Finish	Est	1	LS	87,150.00	87,150		3250.00	3,250	3,250	PNTR	55.58	180,635				267,800
MISC-1	PAINTING																	
		20' WIDTH X 1000 LF			1	45,937.50	45,938		380.00	380	380	PBIT	62.43	23,723				00 70-
MISC-2	ROADWORK	GRAVEL	Est	1 1	LS	45,937.50			360.00	360				23,723				69,700
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4	OTHER																	
MISC-5	CFD MODEL STUDY	***	Est	1	LS.	0.00	9		40.00	40	40	STST	86.46	3,458				3,500
MICC 5	MISC. SUBTOTAL		1				140,438				3,970			223,408				363,900
w.~2	IVIIOC. SUDICIAL																	
	GENERAL SUPPORT				1													
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0				<u> </u>			100,000	· ·			100,000

						Louis	ville Gas & E	lectric			}						Estimate No.:	21997B
Sargent &	& Lundy <sup>LLC</sup>					M	ill Creek Un	t 4			<u> </u>	-			1		Project No.:	10584-022
∩hica						SO3	Mitigation S	vstem	1	-	\$						<del></del>	12/20/2005
				7.7			Horizontal I										Rev Date	ļ.,
<u> </u>	Cost Type: Est = Estimated, Bid = Vendor quote			-			lagnitude Co		<del> </del>		¥							<b></b>
	Cost Type: Est = Estimated, Did = Vendor quote								ļ		<u>.</u>			<u> </u>			Run Date:	1/2//2006
						-C	ONFIDENTI	AL-	Wage Rates	-49394-039-039-039			Louisville	, KY			Preparer:	
				ļ					Labor Produ	ctivity =	÷		1		ļ		Reviewer:	
											7							
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR_ (Install)	Total Projected Cos
GS-2	CRANE RENTAL	700 Ton - 2 months	Est	1	LT		C	Includes freight in and out						310,000				310,00
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			410,000				410,00
	SUBTOTAL						36,450,431			C	184,593			15,319,159			ļ	51,769,80
	Craft Support During Startup	At 3% of Total Manhours		1	<u> </u>						5,538	MECH	66.86	370,256	<u> </u>	<b> </b>	<b> </b>	370,30
<b></b>	Allowance for Premium Time Labor	At 3% of Total Marinours		<b></b>							5,556	MEGH	00.00	370,230			ļ	Not Included
	Productivity Loss Due To Overtime																	Not included
ļ	Per Diem Expense			<u> </u>	<u> </u>				<b> </b>					· · · · · · · · · · · · · · · · · · ·		:		Not included
	Project Wrap (Efficacy) Insurance				1	<u> </u>	:											Not Included
	Erection Contractor's General & Administrative	At 5% of Material and Labor Costs - WESP																
:	Costs Erection Contractor's Profit	At 8% of Material and Labor																1,010,00
		Costs - WESP															ļ	1,616,00 Included
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																w\Equipment Costs
	iviaridatory Spare Farts (Start-up/ resting)	included wiEquipment costs		<b> </b>	<u> </u>		***************************************										1	Included
	Special Tools	Included w\Equipment Costs																w\Equipment Costs
	Consumables	At 0.5% of Equipment/Material Cost										10.5						182,30
		At 4.5% of	,															
	Freight To Site	Equipment/Material Cost		<u> </u>	<b> </b>													1,640,30
	Taxes - Sales/Use/VAT/Business/Etc. Construction Utilities (Elect, Water, etc.) During													7				Not Included
	Construction	Furnished by Owner																By Owner
	SUBTOTAL INSTALLED COST									0	190,131			15,689,415				56,588,70
ENGINEE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team		1						0					-			2,546,00
	TING, MODELING, ETC.			1						Ŏ								_,0 .0,000
	P AND TESTING			1						0					2			100,000
CONTING	GENCY	At 20% of Total								0								11,846,900
CLIENT II	NTERNAL COST	To Be Furnished by Owner								0								200,000
SPARE P										0								Not Included
<b>ESCALA</b>	TION	Not Included		ļ														
INTERES	T DURING CONSTRUCTION (AFUDC)	Not Included																(
	PROJECT TOTAL :			1	1					o								71,281,60

						Louis	ville Gas & E	ectric									Estimate No.	
							ble County U										Project No.	10584-022
r	Lundy LLC						Mitigation Sy										Date	12/20/2005
ag																	Rev Date	1/27/2006
- 1							1 - Hydrated										Run Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Cos		5	Dd			Louisville	KV	:		Preparer	
	COST Type: Let - Lettinine, Lit					-C	ONFIDENTIA	L-	Wage Rates				Louisville	, KI			Reviewer	
			*****						Labor Produ	ctivity =				:			HEVIEWEI	1
tem No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected C</u>
	DUCTWORK MODIFICATIONS																	
	MODIFY GAS DUCT TO ACCEPT INJECTION					er er er er er er er er er er er er er e	<u> </u>					F. 5		2.155			<u> </u>	
)W-1	NOZZLES		Est	1	TN	2,625.00	2,625		35.00	35	35 54	FLDU	89.66	3,138 3,203				5, 4.
	DUCTWORK MODS INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40	1,680		0.27	54	54	DINS	59.32	3,203	1			1 4,
	INSULATION & LAGGING																	
)W-2	DUCTWORK SUPPORT STRUCTURES			<u> </u>		1,890.00	9,450		16.00	80	80	STST	86.46					16,
· · · -	STRUCTURAL STEEL		Est	5 400	TN SF	31.50			0.40	160	160		71.2	11,392				24,
	ACCESS & GALLERIES		Est	400	<del>  "</del>	33									<b></b>			<u> </u>
											329			24,650			<u> </u>	51
NA/ A	DUCTWORK SUBTOTAL						26,355		-		329			24,030				
W-4	DUCTWORK SUBTOTAL																	,
	Injection System																	
	TO WELLEN TO CARDON ENTE											DUNAD	05.00	04:504				310,
S-1	EQUIPMENT/COMPONENTS	150 hp each	Est	5	EA	55,125.00			105.00	525		PUMP TANK	65.83 65.78				<u> </u>	310
	Air Blowers	3 hp - Stainless Steel	Est	3	EA	10,500.00	31,500		30.00	90	90	IANK	05.78	5,920				- 3,
	VFD Rotary Feeder	2,937,600 lb full - 19,615 ft3 -												407 444				770
	- 01 (11 11 11 11 11 10 Pove)	D=20.5' - H=82.0' - CS Silo - SS Hopper	Est	1 1	EA	609,000.00	609,000		2545.52	2,546	2,546	TANK	65.78	167,444			-	776
	Long-Term Storage Silo - 1 Unit (10 Days)	293,760 lb full - 1,920 ft <sup>3</sup> -																ļ
		D=8.5' - H=38.0' - CS Silo - SS				201,600.00	201,600		764.00	764	764	TANK	65.78	50,256				251
	Short-Term Storage Silo - (24 Hours)	Hopper	Est	1 1	EA EA	10,500.00			240.00			MECH	66.86	32,093				53
	Injection Manifold (2 Qty)	Stainless Steel	Est Est	2	LT	10,500.00			240.00	240	240	MECH	66.86	16,046				26
	Injection Nozzles (50 Qty)	Stainless Steel	LSI		1													
	System Piping	Includes fitting allowance	Est	350	LF	18.48	6,468		0.46	161		SPNG	70.4					17
	8" - CS	Includes litting anowarios	Est	0	LF	6.62			0.14	0	0	INSUL WIRE	53.39 69.06	0			<b></b>	
	Piping Insulation & Lagging		Est	0	LF	0.00			0.00	25		SPNG	70.4					2
	Heat Tracing	Allowance	Est	1	LS	1,050.00	1,050		24.75	25	25	SFING	70.4	1,742				
	Valves Supply Piping					040.0	1		100.00		0	SPNG	70.4	0				
	Water Supply	Allowance	Est	0	LS	840.0			80.00	<u> </u>		SPNG	70.4	0		*****		
	Air Supply	Allowance	Est	0	LS	525.0			60.00	60		SPNG	70.4	4,224				5
	Piping Supports	Allowance	Est	1 1	LS	1,575.0 2,200.0			16.00	160		STST	86.46					35
	Piping Rack	Allowance	Est	10	TN	2,200.00											1	
-		INCLUDES EXCAVATION &	Est	50	CY	157.5			7.00	350	350	CONP	52.91	18,519			<b></b>	26
IS-2	FOUNDATIONS	BACKFILL	Est	10	TN	2,200.0	22,000		16.00	160	160	STST PILE	86.46 82.81				<u> </u>	35 116
S-3	STRUCTURAL STEEL AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	2,200	LF	10.0	22,000		0.52	1,144	1,144	PILE	შ∠. <b>8</b> 1	94,735			1	110,
S-4	AUGER CAST PILES (120 TON CAPACITT)						1,232,193				6,704			464,542			1	1,696
S-5	IS SYSTEM SUBTOTAL			_			1,232,193				2,. 01							
-	MATERIAL UNLOADING SYSTEM				-		^ -								ļ			
		INCLUDED IN SILO	Est	0	Set	315,000.0	0 (	)	1753.67	0	0	SPNG	70.4	0				
Au. 1-1	TRUCK DELIVERY	INCLUDED IN SILO		<b>—</b>			,							· '	1			ľ
	AUXILIARY POWER SUPPLY		1														<b></b>	
. *	SYSTEM/I&C		-			4			ķ							·	1	<u> </u>
					- I							F .		<u>ls'</u>	<u> </u>		<u>li</u>	<u> </u>

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							/ille Gas & El									-	Estimate No.:	
	1di. LLC						ble County U										Project No.:	
	Lundy <sup>LLC</sup>						Mitigation Sy									·		12/20/2005
ag	<b>J</b> 0						1 - Hydrated										Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitud <b>e C</b> os							122			Run Date:	1/27/2006
	Cost Type: Est = Estimated, Did = Vendor quote					-C	ONFIDENTIA	L-	Wage Rates				Louisville,	KY			Preparer:	
									Labor Produc	ctivity =			1				Reviewer:	
										:								
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> Equipment or <u>Material Cost</u>	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
		Double Ended Unit Substation					e de la companya de l				-							
		with (2) 2MVA, 6.9-480V			1		000		500.00	500	500	EHEA	53.92	26,960				602,000
	480V SWITCHGEAR	XFMR's	Est	1	EA	575,000.00 63,000.00			500.00 100.00	500 100		EHEA	53.92	∠6,960 5,392				68,400
	New Breaker at Existing 6900V Switchgear		Est	1 1	EA EA	42,000.00			200.00	400	400	EHEA	53.92	21,568				105,600
	MCC		Est Est	2	LS	60,900.00			300.00	300	300	EHEA	53.92	16,176				77,100
	Misc Electrical Equipment & Controls		ESI	<del>                                     </del>	1 20	3,,,,,,,,,,												
										100	400	MUDE	69.06	6,906			<u> </u>	11.10
	GROUNDING Cable - 500kcmil GND		Est	2,000	LF	2.10			0.05 4.00	100 48		WIRE	82.81	3,975			<b> </b>	11,100 6,400
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	I ILE	02.01	3,975	<b> </b>		1	0,40
	diodining Floo						,		<b> </b>									·
AP-3	CABLE			0	+ LF	33.60	0	Routed in 5" Conduit	0.69	0	0	WIRE	69.06	0				(
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est Est	250	1 - <del>[ </del>	14.70	3,675	Routed in 3" Conduit	0.69	173	173		69.06	11,913				15,600
	Power Cables for MCC's	3/C 500kcmil, 5kV 3/C 4/0kcmil, 5kV	Est	0	LF_	8.40	0	Routed in 2" Conduit	0.35	0	0	WIRE	69.06	0				(
	Power Cables for 480V Switchgear	3/C 4/OKCIIII, SKV						Routed in 1-1/2"	0.50	_	_	WIRE	69.06	^			1	,
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	<u>LF</u>	6.30		Conduit Routed in 3/4" Conduit	0.52 0.05	υ A	g g	WIRE	69.06	549				700
F -	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	150	LF LF	1.58		Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549				800
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	150	I LT	1.50	200	Routed in 1-1/2"							1.7			
	Power Cables from MCC to Loads - 50 HP	3/C #4, 600V	Est	150	LF	2.10		Conduit Routed in 1-1/2"	0.09	14	14	WIRE	69.06	932				1,200
	Day Oaklas from MCC to Londo 100UD	3/C #4/0, 600V	Est	150	LF	9.4		Conduit	0.50 0.69	75 207	75 207		69.06 69.06	5,180 14,295			1	6,600 17,400
<u> </u>	Power Cables from MCC to Loads - 100HP Power Cables from MCC to Loads - 150HP	3/C #350, 600V	Est	300	LF	10.50		Routed in 2" Conduit Routed in 3/4" Conduit	0.69	207 5	207 5	WIRE	69.06	14,295 332				400
<b> </b>	Control Cables - Pumps	5/C #14, 600V	Est	150	LF	0.6	101	Routed in 1-1/2"	0.00		<u> </u>		55.55	332		1907-1		100
	Control Cables 1 amps			1 .	LF	0.8	. 0	Conduit	0.04	- 0	0	WIRE	69.06	0				(
	Control Cables - TR Sets	7/C #14, 600V 2 PR #16 SHLD	Est Est	750	LF	0.2	189	Routed in 3/4" Conduit	0.03	24	24	WIRE	69.06					1,800
	Instrumentation Cables	2 PH # 10 SHLD	Est	1,000	LF	3.1	3,150	Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210				5,400
	Data Highway Cable						1		<b> </b>									
AP-4	RACEWAY			1	- LF	2.0	4,733		0.19	446	446	ECND	49.67	22,163				26,900
AF	3/4" Conduit		Est	2,300 300	LF	4.6			0.28	446 85	85	ECND ECND	49.67	4,232				5,600
	1-1/2" Conduit		Est Est	300	LF	6.2	1,874		0.35	106	106	ECND	49.67	5,245				7,100
	2" Conduit		Est	900	LF	13.1	11,813		0.65	581	581	ECND	49.67	28,833			<u> </u>	40,600
	3" Conduit		Est	0	7 LF	38.3	3 0		1.13	0	-0	ECND	49.67	U				
	5" Conduit																	
AP-5	DCS SYSTEM ADDITIONS		<del></del>		EA	31,500.0	31,500		40.00	40	40	EHEA	53.92	2,157	<u> </u>			33,700
71 3	Cabinets		Est	1	+ EA	31,000.0	1											
			-		1							FUEC	50.00	1 10=				
AP-8	DCS PROGRAMMING/INTERFACE		Est	1	EA	2,625.0		1	20.00 0.00	20		WIRE	59.36 69.06	1,187				3,800 5,300
	Interface Hardware Programming /Interface		Est	1	LT	5,250.0	5,250		0.00		Ų	AAILIE	09.00					5,500
	riogramming /mieriace				1 7	10,500.0	10,500		100.00	100	100	INEL	60.02	6,002				16,500
AP-9	LIGHTING ALLOWANCE		Est		LT	10,300.0	10,500	,										
٣			-															
	WALLEN DOWNER OVOTER (10.0 CURTOTAL						871,538				3,370			188,413				1,060,000
V I	AUXILIARY POWER SYSTEM / I&C SUBTOTAL																<b> </b>	
<u></u>	REINFORCING OF EXISTING								I									
		NONE					è .									A		
	EQUIPMENT	1,0,12	1								<u> </u>							

						Louis	/ille Gas & E	ectric									stimate No.	
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ar 14 &	Lundy LLC						Mitigation Sy										Date	: 12/20/2005
aç					-	303	willigation by	315111 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1									<del> </del>	1/27/2006
- Ť						Optior	1 - Hydrated	Lime	-				-					
						Order of M	agnitude Co	st Estimate										: 1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote					-C	ONFIDENTIA	L-	Wage Rates	Based on:		-	Louisville	, KY			Preparer	
									Labor Produ	ctivity =	•		1		:		Reviewer	:
					<u> </u>													l'
ltem No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Co
	MISCELLANEOUS	NONE															: :	
	INICOLLEANEOUS								1	2 2 3 7 7 7		DAITE	EE E2	65.000				68,2
	DANITINO	Touch-up and Field Finish	Est	1	LS	3,150.00	3,150		1170.00	1,170	1,170	PNTR	55.58	65,029			<b>I</b>	68,2
MISC-1	PAINTING	rodon ap and riola rimon							200.00			PBIT	62.43				<u> </u>	
4000	DOADWORK		Est	0	LS	36,750.00	0		380.00	0	J	PDII	02.43			·	<u> </u>	-
MISC-2	ROADWORK								300.00			YDRN	51.97					
MICCO	STORM DRAINAGE		Est	0	LS	7,350.00	<del> </del>		300.00			101111	51.37	l				
IVIIOU-J	OTOTIW DITAINAGE																	
MISC-4	OTHER											l						
	BLOWER HOUSE	INCLUDES EXCAVATION &			-													
			Est	25	CY	157.50	3,938		7.00	175	175	CONP STST	52.91	9,259				13,2
	FOUNDATIONS	BACKFILL	Est	1 1	LS	38,000.00			130.00	130	130	STST	86.46	11,240				49,2
	PREFAB BLDG. 15'X20'																	
					-:						1 475			85,528				130,6
	NICO CUPTOTAL						45,088				1,475			05,520				130,0
Miou-5	MISC. SUBTOTAL																	
									-									
	GENERAL SUPPORT											<b></b>						
	GENERAL SUFFORT						1		_			<b></b>		150,000				150,0
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT				-					100,000				1,
GO-1	MOBILIZATION / BEMOBILIZATION				_		1		1		0			150,000				150,0
GS-2	GENERAL SUPPORT SUBTOTAL																	
<del></del>				_	<del>-  </del>		2,175,174			0	11,878			913,133				3,088,3
	SUBTOTAL																	.[
		ti and t Tatal Mambaura									356	MECH	66.86	23,826				23,8
	Craft Support During Startup	At 3% of Total Manhours	<u> </u>															Not Included
	Allowance for Premium Time Labor																	Not Included
	Productivity Loss Due To Overtime																	Not Included Not Included
	Per Diem Expense																	INOL INCIDIDED
	Project Wrap (Efficacy) Insurance Erection Contractor's General & Administrative	At 5% of Material and Labor									·							154,4
		Costs																107,7
<u> </u>	Costs	At 8% of Material and Labor																247,1
1	Erection Contractor's Profit	Costs																Included
																		w\Equipment
1															-			Costs Included
1.	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs	<u> </u>															
			1													-		w\Equipment
		In alcohol (AFaction and Costs																Costs
	Special Tools	Included w\Equipment Costs At 0.5% of Equipment/Materia	1		1				1									
		Cost	1															10,9
	Consumables	At 4.5% of Equipment/Materia																97,9
ł		Cost	1						1									Not Included
ļ	Freight To Site	OUSI	1															NOT INCINGED
L	Taxes - Sales/Use/VAT/Business/Etc. Construction Utilities (Elect, Water, etc.) During								1									By Owner
1	Construction Utilities (Elect, Water, etc.) During	Furnished by Owner					1		1					·				Dy Owner
1	Construction								1		12,235			936,958			:	3,622,4
<b> </b>																		

Page 3 of 4

						Louisy	ille Gas & E	lectric		-						E	stimate No.:	21975B
							ble County U			***************************************							Project No.:	10584-022
Sarnent &	Lundy LLC						Mitigation Sy										Date:	12/20/2005
ag							1 - Hydrate										Rev Date	1/27/2006
						Order of M	agnitude Co	et Fetimate									Run Date:	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote								Wage Rates	Based on:			Louisville	, KY			Preparer:	
							ONFIDENTIA		Labor Produ				1				Reviewer:	,
<u>Item No.</u>	<u>Description</u>	Scope Definition	Cost Type	<u>Quantity</u>	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	Total Projected Cost
																		362,240
ENGINEE	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team																302,240
PERMITTI	ING, MODELING, ETC.																	50,000
STARTUP	P, TESTING AND REAGENT (15 DAYS)									C								806,900
CONTING	ENCY	At 20% of Total		-						C								100,000
	ITERNAL COST	Furnished by Owner								C								Not Included
SPARE PA		Not Included	l															0
ESCALAT	T DURING CONSTRUCTION (AFUDC)	Not included							<u> </u>			ļ						
INTERES	1 DUNING CONSTRUCTION (AI CDC)								<u> </u>	<u> </u>								4,941,540
	PROJECT TOTAL:		<u> </u>		<u> </u>			L	L									

					l	1	/ille Gas & E	lectric									Estimate No.:	21969B
																	Project No.:	10584-022
arcent 8	Lundy LLC						ble County U										ļ <u>.</u>	12/20/2005
	go						Mitigation Sy										Rev Date	1/27/2006
							Magnesium		-									1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Cos						Louisville	VV			Preparer:	
						-C	ONFIDENTIA	<u>L-</u>	Wage Rates				Louisville	, KT			Reviewer:	ļ
									Labor Produc	ctivity =							TICVICIVEI .	
																	<u> </u>	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	Total Projected Cos
	DUCTWORK MODIFICATIONS				-													
	MODIFY GAS DUCT TO ACCEPT INJECTION											<u> </u>		0.400			<u> </u>	- E 0/
DW-1	NOZZLES DUCTWORK MODS		Est	1	TN	2,625.00			35.00	35 54			89.66 59.32	3,138 3,203		<b> </b>		5,80 7,40
	INSULATION & LAGGING	6" THICK INSULATION	Est	200	SF	21.00	4,200		0.27	54	54	CHIC	09.32	3,203				1,40
												-						
DW-4	DUCTWORK SUPPORT STRUCTURES	<b> </b>	Est	5	TN	1,890.00	9,450		16.00	80		STST	86.46	6,917				16,40
	STRUCTURAL STEEL ACCESS & GALLERIES	1	Est	400	SF	31.50			0.40	160	160	GALL	71.2	11,392			<del> </del>	24,00
	AUGESS & GALLERIES											1				<b>I</b>		
DW-6	BOILER MODS		Est	2	TN	2,625.00	5,250		35.00	70	70	FLDU	89.66	6,276	7		1	11,50
	WALL AND TUBE MODS										:	<u> </u>					-	
					<u> </u>							1						
					-		34,125				399			30,926				65,10
<u> </u>	DUCTWORK SUBTOTAL																-	
·												-			· · · · · · · · · · · · · · · · · · ·			
	Injection System																	
	III)COLIOII OYOLOIII	- 1										<b></b>					<b>-</b>	
IS-1	EQUIPMENT/COMPONENTS								40.00	120	120	MECH	66.86	8,023			1	71,00
	Air Blowers	Not required	Est	3	EA	21,000.00	63,000		30.00	30		MECH	66.86	2,006		1	1	12,50
	VFD Rotary Feeder	Not required	Est	1 1	EA	10,500.00	10,500		1 00.00									
-		1,617,900 lb full - 17,060 ft3 - D=26.3' - H=31.6' -	Est	1	EA	105,000.00	105,000		580.00	580		TANK	65.78	38,152			-	143,20
	Long-Term Storage Tank - 1 Unit (10 Days) Short-Term Storage Silo - (24 Hours)	Not required	Est	<del>                                     </del>	EA	10,500.00	0		60.00	0	0	TANK MECH	65.78 66.86			<u> </u>	<b>-</b>	52,70
	Air Compressors (2 Qty)	50 hp - 2 X 100%	Est	2	EA	21,000.00	42,000		80.00	160	160	MECH	00.00	10,096			1	J2,70
	All Compressors (E QQ)	808,320 lb full - 8,520 ft3 -										ŀ						
		D=20.8' - H=25.0' - CS Silo -	Est	1	EA	115,500.00	115,500		880.00	880		TANK	65.78				1	173,40
	Mixing Tank - 1 Unit - (24 Hours)	SS Hopper 20 hp - CS Shaft	Est	1 1	EA	21,000.00			30.00	30	30	MECH	66.86	2,006				23,00
	Mixing Tank Agitator (1 Qty)	125,000 lb full - 2,000 ft3 -		T					000.00	000	900	TANK	65.78	57,886			1	173,40
	Water Storage Tank - 1 Unit (24 Hrs)	D=13.7' - H=13.7' - CS	Est	1	EA	115,500.00			880.00 20.00	880 120		PUMP	65.83				1	39,40
	Slurry/Water Pumps (6 Qty)	2 hp - CS	Est	6	EA	5,250.00 10,500.00			240.00	480	480	MECH	66.86	32,093				53,10
	Injection Manifold (2 Qty)	Stainless Steel	Est Est	2	EA LT	42,000.00			96.00		96	MECH	66.86					48,40
	Dual Fluid Injection Nozzles (20 Qty)	Stainless Steel	ESI	<del>                                     </del>	<del>                                     </del>	12,000.00		-				<u></u>						
	System Piping	Includes fitting allowance	Est	300	LF	2.27			0.16			SPNG	70.4					4,10
	1" - CS	Includes fitting allowance	Est	50	LF	9.28	464		0.33	17		SPNG	70.4				ļ	1,60
	4" - CS	Includes fitting anowariou	Est	350	LF	2.99	1,047		0.08	26 109	26	INSUL WIRE	53.39 69.06			<b> </b>		2,40 14,80
	Piping Insulation & Lagging Heat Tracing		Est	350	LF	21.00			0.31	109 25		SPNG	70.4	1,742			1	2,80
	Valves	Allowance	Est	1	LS	1,050.00	1,050		24.75		<sup>23</sup>	, or NG	1 ,0.4	1,742				1
	Supply Piping			1	1.0	840.00	168,000		100.00	20,000	20,000	SPNG	70.4	1,408,000				1,576,00
	Water Supply	Allowance	Est	200	LS	525.00			80.00	16,000		SPNG		1,126,400				1,231,40
	Air Supply	Allowance	Est	200	LS LS	2,100.00			40.00	40	40	SPNG	70.4	2,816				4,90
	Piping Supports	Allowance	Est Est	10	TN	2,200.00			16.00	160	160	STST	86.46	13,834			1	35,80
	Piping Rack	Allowance INCLUDES EXCAVATION &	Lat	10								COMP	52.91	40,741				58,10
IS-2	FOUNDATIONS	BACKFILL	Est	110	CY	157.50			7.00 16.00	770 160	160	CONP STST	86.46					35,80
IS-2 IS-3	STRUCTURAL STEEL		Est	10	TN	2,200.0	22,000	4	10.00	100	100						-	

			T		T	Louis	ville Gas & E	lectric								E	stimate No.:	21969B
			<u> </u>				ble County U										Project No.:	10584-022
Sargent 8	Lundy <sup>LLC</sup>						Mitigation Sy										Date:	12/20/2005
ca							Magnesium										Rev Date	1/27/2006
																	Run Date:	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co		Wage Rates	Based on:			Louisville	KY	:		Preparer:	
						-0	ONFIDENTIA		Labor Produ				1				Reviewer:	
			<u> </u>						Labor Produ	ctivity =			•					
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	Total Projected Cost
			- Fot	0	I LF	10.00	1 0		0.52	0	0	PILE	82.81	0				0
IS-4	AUGER CAST PILES (120 TON CAPACITY)	90 ft LONG	Est	0	<u>L</u>	10.00	<u> </u>											
10.5	IS SYSTEM SUBTOTAL		1	1			914,017				40,731			2,843,955				3,757,800
IS-5	IS STOLEM SUBTUIAL								ļ				<u> </u>					
1				<b></b>	-								<u> </u>					
	MATERIAL UNLOADING SYSTEM			<u> </u>														
			Est	1 1	Set	105,000.00	105,000		1254.00	1,254	1,254	SPNG	70.4	88,282				193,300
ASH-1	TRUCK UNLOADING SYSTEM		LSt	<del>                                     </del>	1 000	1,00,000												400.000
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL						105,000				1,254			88,282				193,300
AIT-U	MATERIAL OREGADING STOTEM SOCIETY										- ,							
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE						<u> </u>											
F -	1 OWEN GOONGE	Double Ended Unit							1.0									
	1	Substation with (2) 1 MVA,	l		EA	570,000.00	570,000		4228.49	4,228	4,228	EHEA	53.92	228,000	·			798,000
	SWITCHGEAR	6.9-480V XFMR's	Est Est	<del>                                     </del>	EA	63,000.00			100.00	100	100	EHEA						63,000
	New Breaker at Existing 13.2kV Switchgear		Est	2	EA	42,000.00	84,000		200.00	400		EHEA	53.92					105,600
	MCC Misc Electrical Equipment & Controls		Est	1	LS	8,400.00	8,400		1418.55	1,419	1,419	EHEA	53.92	76,488				84,900
	Misc Electrical Equipment & Controls								<b> </b>		- U							
AP-2	GROUNDING			1 0000	<del>                                     </del>	2.10	4,200		0.05	100	100	WIRE	69.06	6,906				11,100
	Cable - 500kcmil GND		Est	2,000 12	LF EA	199.50			4.00	48	48	PILE	82.81	3,975				6,400
	Grounding Rod		Est	12	- EA	100.0	2,00											
AP-3	CABLE	3/C 750kcmil, 5kV	Est	0	LF	33.6		Routed in 5" Conduit	0.69	0		WIRE	69.06	0				0
	Power Cables for MCC's Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.7		Routed in 3" Conduit	0.69 0.35	173	173	WIRE WIRE						
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.4	0	Routed in 2" Conduit Routed in 1-1/2"	0.35			WINE						
			<b> </b>	1 0	LF	6.3	م ا	Conduit	0.52	0	0	WIRE	69.06	o				0
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est Est	300	LF	0.7	6 227	Routed in 3/4" Conduit	0.05	16	16	WIRE	69.06					1,300
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V 3/C #8, 600V	Est	150	LF	1.5		Routed in 3/4" Conduit	0.05	8	8	WIRE	69.06	549				800
	Power Cables from MCC to Loads - 15HP	υ/Ο πο, υυυν	1 ===	1				Routed in 1-1/2"				WIRE						
1	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	0	LF	2.1	2 0	Conduit Routed in 1-1/2"	0.09	0	l 0	WIHE						
<b>_</b>				1	1	2.6	7 267	Conduit	0.35	35	35	WIRE						
•	Power Cables from MCC to Loads - 50HP	3/C #4, 600V	Est Est	100 50	LF LF	3.5		Routed in 2" Conduit	0.35	18	18	WIRE	69.06					1,400
	Power Cables from MCC to Loads - 60HP	3/C #2, 600V	Est	300	LF	0.6		Routed in 3/4" Conduit	0.03		10	WIRE	69.06	663				900
-	Control Cables - Pumps	5/C #14, 600V		1	1 -			Routed in 1-1/2"				WIDE	60.00					,
	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.8	'	Conduit	0.04 0.03			WIRE WIRE	69.06 69.06					1,800
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.2 3.1		Routed in 3/4" Conduit Routed in 3/4" Conduit	0.03	32	32	WIRE	03.00	1,007				1,000
1	Data Highway Cable		Est	1,000	LF	3.1	3,150	in located in 6/4 Conduit	1 3.50									
				-														
1/	RACEWAY		Est	2,500	LF	2.0			0.19	485		ECND						
<b>!</b> —	3/4" Conduit 1-1/2" Conduit		Est	100	LF	4.6			0.28	28								
	1-1/2" Conduit		Est	50	LF	6.2			0.35 0.65	18 161	161							
<b> </b>	3" Conduit		Est Est	250 0	LF LF	13.1 38.3			1.13			ECND						

						Louis	ville Gas & E	lectric	:							E	stimate No.	: 21969B
Sargent &	Lundy <sup>LLC</sup>						ble County L											: 10584-022
cag	lo						Mitigation Sy					-	-					12/20/2005
						Option 2 -	Magnesium	Hydroxide									-	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co			D			Louisville	LV.		-	Preparer	: 1/27/2006
					-	-C	ONFIDENTIA	AL-	Wage Rates Labor Produ		1	ļ	Louisville	, KT			Reviewer	
									Lubortrout									
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	<u>DOR</u> (Install)	Total Projected Cost
											0					•		
	DCS SYSTEM ADDITIONS Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA					:	
											0		<u> </u>					
	DCS PROGRAMMING/INTERFACE Interface Hardware		Est	1	EA	2,625.00			20.00	20	20	EHEC						
	Programming /Interface		Est	1	LT	5,250.00	5,250		0.00	<u> </u>	0	WIRE	69.06	0				5,300
40.0	LIQUITING ALLOWANCE		Est	1 1	LT	10,500.00	10,500		100.00	100	100	INEL						
AP-9	LIGHTING ALLOWANCE													:				
							799,199				7,462			342,113				1,080,500
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL																	
	REINFORCING OF EXISTING EQUIPMENT	NONE					Notes and										-	
	DEMOLITION / BELOCATIONS	NONE																
	DEMOLITION / RELOCATIONS	NONL																
	MISCELLANEOUS	NONE			_									-				
MISC 1	PAINTING	Touch-up and Field Finish	Est	1	LS	5,250.00	5,250		1550.00	1,550	1,550	PNTR	55.58	86,149				91,400
			,		1.0	36,750.00			380.00			PBIT	62.43	0				1
MISC-2	ROADWORK	Not Required	Est	0	LS	36,730.00												
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
									-									
MISC-4	OTHER														-			
	PUMP HOUSE 15' X 20'	INCLUDES EXCAVATION &					<u> </u>											
	FOUNDATIONS	BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,200
	TOURDATIONS			1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,200
	PREFAB BLDG.		Est			30,000.00												
MISC-5	MISC. SUBTOTAL						54,538				2,155			122,239				176,700
	GENERAL SUPPORT								_	<u> </u>								
00.4	MOBILIZATION / DEMOBILIZATION		Est	1 1	LT		0							100,000		300.2		100,000
											n			100,000				100,000
GS-2	GENERAL SUPPORT SUBTOTAL			-			1											
	SUBTOTAL						1,906,879			0	52,001			3,527,515				<b>5,373,400</b>
		At 3% of Total Manhours	1	1							1,560	MECH	66.86	104,304				104,300
	Craft Support During Startup Allowance for Premium Time Labor	AL 3 /0 OF TOTAL INIGHTIOUS																Not Included Not Included
	Productivity Loss Due To Overtime															**************************************		Not Included
	Per Diem Expense Project Wrap (Efficacy) Insurance																	Not Included
	Erection Contractor's General & Administrative	At 5% of Material and Labor	-					v v			Marian Salaharan Marian Salaharan Marian Salaharan							268,700
	Costs	Costs	<u> </u>	<u> </u>	<b>1</b> 00 - 100		l'		<u> </u>				L					

						Louis	ville Gas & E	lectric								E	stimate No.:	21969B
							ble County U										Project No.:	10584-022
Sar 1&	Lundy LLC						Mitigation Sy										Date	12/20/2005
ag					-	303	Magnesium	Uudrovida			-						Rev Date	1/27/2006
— Ť						Option 2 -	Magnesium	nyuroxiue										1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate						L				<del> </del>
	Cost Type: Est = Estimated, Bid = Vehiclo quote					-C	ONFIDENTIA	\L-	Wage Rates				Louisville	, KY			Preparer	
									Labor Produ	ctivity =		ļ	1			ļ	Reviewer	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
		At 8% of Material and Labor													·			429,90
	Erection Contractor's Profit	Costs										ļ					<u> </u>	Included
		Included w\Equipment Costs																w\Equipment Costs Included
	Mandatory Spare Parts (Start-up/Testing)																	w\Equipment Costs
	Special Tools	Included w\Equipment Costs At 0.5% of		1													:	9,50
	Consumables	Equipment/Material Cost At 4.5% of																85,8
	Freight To Site	Equipment/Material Cost	<u> </u>															Not Included
	Taxes - Sales/Use/VAT/Business/Etc. Construction Utilities (Elect, Water, etc.) During	Furnished by Owner																By Owner
	Construction	Fulfillshed by Owner								1	53,561	<u> </u>		3,631,818				6,271,60
t =	SUBTOTAL INSTALLED COST		-											-,,-10				
ENGINE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team							1	0								627,20
DERMIT	TING, MODELING, ETC.				_					0		<b>1</b>						50,00
STARTU	P, TESTING AND REAGENT (15 DAYS)									0								1,389,80
CONTING	GENCY	At 20% of Total		_						0								100,00
CLIENT	NTERNAL COST	To Be Furnished by Owner	-							0								Not Included
SPARE F	PARTS	Net Included		+		-						<b> </b>					<u> </u>	<u> </u>
<b>FSCALA</b>	TION	Not included		1								<b>_</b>					<u> </u>	-
INTERES	ST DURING CONSTRUCTION (AFUDC)	Not Included								0								8,438,60
<u> </u>	PROJECT TOTAL:			1		<u> </u>					L			L	L		<u> </u>	

					1	Louis	/ille Gas & E	ectric								E	stimate No.	: 21983B
		ш					ble County U										Project No.	: 10584-022
	Lundy LLC						Mitigation Sy										<del> </del>	: 12/20/2005
cag	30			· · · · · · · · · · · · · · · · · · ·			ion 3 - Soda										Rev Date	1/27/2006
							agnitude Cos		<u> </u>								Run Date	: 1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote								Wage Rates	Based on:			Louisville	. KY			Preparer	
						-0	ONFIDENTIA	<b>1</b> —	Labor Produ				1	<u> </u>			Reviewer	
									Luborrioud								11011011	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	<u>Total</u> Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cost
	DUCTWORK MODIFICATIONS																	
	MODIFY GAS DUCT TO ACCEPT INJECTION										-							
	NOZZLES								I	<u> </u>		EI C	-00.00	0.465			<b></b>	5.000
154451	DUCTWORK MODS		Est	1	TN	2,625.00	2,625		35.00 0.27	35 54		FLDU DINS	89.66 59.32	3,138 3,203	ļ			5,800 4,900
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40	1,680		0.27	54		פאווע	J9.32	3,203			<u> </u>	4,900
	DUOTINODI OLIDOODI OTRI ICTURES				<b> </b>	1												
DW-4	DUCTWORK SUPPORT STRUCTURES STRUCTURAL STEEL		Est	5	TN	1,890.00	9,450		16.00	80		STST	86.46	6,917				16,400
	ACCESS & GALLERIES		Est	400	SF	31.50	12,600		0.40	160	160	GALL	71.2	11,392		-		24,000
	7100E00 G OF TELETITION																	
					<b>-</b>		26,355				329			24,650				51,100
DW-9	DUCTWORK SUBTOTAL												-				······································	
	Injection System																	
						1	1 000 000		200.00	200	300	PUMP	65.83	13,166				1,813,200
	EQUIPMENT/COMPONENTS		Est	11	EA	1,800,000.00	1,800,000		200.00	200	200	FUNIF	05.65	13,100				1,613,200
	Process Technology Package (PTP) by URS	4 - CS internals - 2.0 HP / 4 -																
	n (0.0k)	SS internals - 1.0 HP	Est	6	EA	2,100.00	12,600		20.00	120	120	PUMP	65.83	7,900				20,500
	Pumps (6 Qty)	420,250 lb full - 5,180 ft <sup>3</sup> -										<b>#</b>	05.70	05.000				70.000
	Soda Ash Solution Tank - 1 Unit (10 Days)	D=17.6' - H=21.2' - SS	Est	11	EA	43,050.00	43,050		535.21	535	535	TANK	65.78	35,206				78,300
		309,312 lb full - 4,957 ft <sup>3</sup> -	Ent	1	EA	39,375.00	39,375		489.52	490	490	TANK	65.78	32,201				71,600
	Soft H <sub>2</sub> O Storage Tank - 1 Unit - (24 Hours)	D=18.48' - H=18.48' - CS SS Shaft - 20 HP	Est Est	1 1	EA	21,000.00			30.00	30	30	MECH	66.86	2,006				23,000
	Agitator (1 Qty) Air Compressors (2 Qty)	2 x 100% - 50 HP	Est	2	EA	21,000.00	42,000		80.00		160	MECH	66.86				***************************************	52,700
	Injection Manifold (2 Qty)	Stainless Steel	Est	2	EA	10,500.00			240.00 480.00	480 480	480	MECH MECH	66.86 66.86	32,093 32,093				53,100 53,100
	Dual Fluid Injection Nozzles (100 Qty)	Stainless Steel	Est	11	LT	21,000.00	21,000		480.00	460	400	MECH	00.00	32,093				53,100
		L=250' - D=4" - SS / L=50' -									,							-
	System Piping	D=4" - CS / L=50' - D=2" - SS	Est	250	- LF	30.61	7,652		0.42	105	105	SPNG	70.4	7,392				15,000
	6" - SS	Includes fitting allowance Includes fitting allowance	Est	50	LF	11.89			0.42	21	21	SPNG						2,100
	6" - CS		Est	50	LF	24.89			0.33	17	17	SPNG	70.4	1,162				2,400
	4" - SS	Includes fitting allowance	Est	350	LF	9.14	3,197		0.17	60	60	INSUL	53.39	3,177				6,400
	Piping Insulation & Lagging Heat Tracing		Est	350	ĹF	21.00	7,350		0.31	109		WIRE	69.06					14,800
	Valves	Allowance	Est	1	LS	2,520.00	2,520		48.00	48	48	SPNG	70.4	3,379				5,900
	Supply Piping								10000		100	CDMO	70.4	7.040				1 7000
	Water Supply	Allowance	Est	1	LS	840.00			100.00	100 80		SPNG SPNG	70.4 70.4					7,900
	Air Supply	Allowance	Est	1	LS	525.00			80.00 112.00	112		SPNG	70.4	7,885		***************************************		6,200 10,800
	Piping Supports	Allowance	Est	10	LS TN	2,940.00 2,200.00			16.00	160	160	STST	86.46	13,834				35,800
	Piping Rack	Allowance INCLUDES EXCAVATION &	Est	10	1111	2,200.00	22,000											
IS-2	FOUNDATIONS	BACKFILL BACKFILL	Est	75	CY	157.50	11,813		7.00	525	525	CONP	52.91	27,778				39,600
	OTDUCTUDAL STEEL		Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
	STRUCTURAL STEEL											DILE	82.81					
IS-3	AUGER CAST PILES (125 TON CAPACITY)	100 ft LONG	Est	0	LF	10.00	0		0.52	0	0	PILE	8∠.81	U				0
IS-3	ROYALTY FEE		Est Est	0	LF									0				0
1:00							<u> L</u>		1	L	<u> </u>				·			<u> </u>

						Louis	ville Gas & E	lectric .	T	<u> </u>							stimate No.:	: 21983B
		:					ble County L										Project No.:	
S>nt 8	Lundy <sup>LLC</sup>						Mitigation Sy										<del> </del>	: 12/20/2005
ca							ion 3 - Soda		1								Rev Date	1/27/2006
							agnitude Co		1								Run Date:	: 1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer	
						-0	ON IDENTIF	\ <b>L</b> _	Labor Produ				1				Reviewer	
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Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
10.4	IO OVOTEM CURTOTAL						2,082,700				3,990			265,444				2,348,200
IS-4	IS SYSTEM SUBTOTAL															***************************************		
	MATERIAL UNLOADING SYSTEM												7					
					Set	105,000.00	105,000		1254.00	1,254	1.254	SPNG	70.4	88,282				193,30
ASH-1	TRUCK UNLOADING SYSTEM		Est	1 1 1	Set	103,000.00	100,000		1.254.00									
АН-6	MATERIAL UNLOADING SYSTEM SUBTOTAL						105,000				1,254			88,282				193,30
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
<b></b>	3131EW/IQU									<u> </u>								
AP-1	POWER SOURCE	Double Ended Unit Substation with (2) 1MVA,												00.000				407.00
	SWITCHGEAR	6.9-480V XFMR's	Est	1	EA	460,000.00			500.00 100.00	500	500	EHEA	53.92 53.92	26,960 5,392				487,00 68,40
	New Breaker at Existing 13.2kV Switchgear		Est	1 1	EA EA	63,000.00 42,000.00	63,000 84,000		200.00	400			53.92	21,568				105,60
	MCC Misc Electrical Equipment & Controls		Est Est	1	LS	8,400.00	8,400		300.00	300	300		53.92	16,176				24,60
AP-2	GROUNDING									400	400	WIDE	60.00	6,906				11,10
AP-Z	Cable - 500kcmil GND		Est	2,000	LF	2.10 199.50			0.05 4.00	100	100	WIRE	69.06 82.81	3,975				6,40
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	1	-10	11111	02.01	0,0.0				0,10
				1														
AP-3	CABLE Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60		Routed in 5" Conduit	0.69	0	0	WIRE	69.06	0				15,60
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.70		Routed in 3" Conduit	0.69 0.35			WIRE WIRE	69.06 69.06	11,913				15,00
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF	8.40		Routed in 2" Conduit Routed in 1-1/2"	0.35	<u>-</u>		VVIIIL	03.00					
		3/C #2/0, 600V	Est	0	LF	6.30		Conduit	0.52	0	O	WIRE	69.06					1
	Power Cables from Switchgear to TR Sets Power Cables from MCC to Loads - 1 ~ 5HP	3/C #2/0, 600V	Est	200	LF	0.70	151	Routed in 3/4" Conduit			11	WIRE	69.06	732				90
	Power Cables from MCC to Loads - 1 ~ 5HP  Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	LF	1.58	3 C	Routed in 3/4" Conduit Routed in 1-1/2"	0.05	0	0	WIRE	69.06	0				
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	50	LF	2.12	106	Conduit Routed in 1-1/2" Routed in 1-1/2"	0.09	5	5	WIRE	69.06	311	-			40
		0/0 #4 600)/	Est	100	LF	2.6	267	Conduit	0.35	35	35	WIRE	69.06	2,417				2,70
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V 3/C #2, 600V	Est	200	LF	9.90	1,980	Routed in 2" Conduit	1.55	310	310	WIRE	69.06	21,409		****		23,40
	Power Cables from MCC to Loads -150HP Control Cables - Pumps	5/C #2, 600V	Est	175	LF	0.6	7 118	Routed in 3/4" Conduit	0.03	6	6	WIRE	69.06	387				50
	COINTOI Cables - Lamps					0.00		Routed in 1-1/2" Conduit	0.04	<u> </u>	0	WIRE	69.06	ი				1
	Control Cables - TR Sets	7/C #14, 600V	Est Est	750	LF LF	0.8		Routed in 3/4" Conduit		. 24	24	WIRE	69.06	1,657				1,80
	Instrumentation Cables Data Highway Cable	2 PR #16 SHLD	Est	1,000	LF	3.1		Routed in 3/4" Conduit			32	WIRE	69.06	2,210				5,400
AD 4	DACEWAY		1								110	FOUR	40.07	00 477				24,80
AP-4	RACEWAY  3/4" Conduit		Est	2,125	LF	2.0			0.19 0.28		412	ECND ECND	49.67 49.67	20,477 2,116				24,800
	1-1/2" Conduit		Est	150 200	LF LF	4.6 6.2			0.25		70	ECND	49.67	3,497				4,700
	2" Conduit		Est Est	250	LF	13.1	3 3,281		0.65	161	161	ECND	49.67	8,009				11,30
	3" Conduit 5" Conduit		Est	0	LF	38.3			1.13	0	0	ECND	49.67	0	:			
AP-5	DCS SYSTEM ADDITIONS Cabinets		Est	1	EA	31,500.0	0 31,500		40.00	40	40	EHEA	53.92	2,157				33,700
											<u> </u>	1		x				
AP-8	DCS PROGRAMMING/INTERFACE		<del>, I</del>															

PROJECTS\21983B1 Trimble\_Opt\_3.xls\Sodium Bisulfite

							ville Gas & E		-				-			E	stimate No.:	21983B
Sargent &	Lundy <sup>LLC</sup>						ble County L										Project No.:	10584-022
hica!	go					SO3	Mitigation Sy	/stem									Date:	12/20/2005
						Opt	ion 3 - Soda	Ash									Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co										Run Date:	1/27/2006
					<u> </u>		ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer:	
									Labor Produ	ıctivity =			1				Reviewer:	
7								•										
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Co</u>
					ΕΛ	2 625 00	2,625		20.00	20	30	EHEC	59.36	1,187				3,80
	Interface Hardware		Est Est	1 1	EA LT	2,625.00 5,250.00	2,625 5,250		0.00	0		WIRE	69.06	1,167				5,30
	Programming /Interface		Lot			0,200.00	0,200		1				- 00.00					0,00
AP-9	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003			,	24,80
					<b></b>													
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						696,360				2,939			168,458				865,00
AF-10	AUXILIANT FOWEN STOTEM / NO CODICIAL																	
	REINFORCING OF EXISTING EQUIPMENT	NONE															1	N. 19
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE												·				
MISC-1	PAINTING	Touch-up and Field Finish	Est	1. 1	LS	3,675.00	3,675		1250.00	1,250	1,250	PNTR	55.58	69,475				73,20
2	ROADWORK		Est	0	LS	36,750.00	0		380.00	0	0	PBIT	62.43	0				
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,90
IVIIOU-3	O TORIVI DRAIIVAGE					1,000.00	.,000											
MISC-4	OTHER								-									
	PUMP HOUSE 15' X 20'					·												
	FUMIL HOUSE 13 A ZU	INCLUDES EXCAVATION &																
IS-2	FOUNDATIONS	BACKFILL	Est	25	CY	157.50			7.00			CONP	52.91	9,259				13,20
	PREFAB BLDG.		Est	1	LS	38,000.00	38,000		130.00	130	130	STST	86.46	11,240				49,20
MISC	MISC. SUBTOTAL						52,963				1,855			105,565				158,50
WILGO-0	INIO. OUDIOTAL																	
	GENERAL SUPPORT																	
									<u> </u>					100,000				100.00
GS-1	MOBILIZATION / DEMOBILIZATION		Est	11	LT		0		<b> </b>					100,000				100,00
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,000
	SUBTOTAL						2,963,377			0	10,367			752,399				3,716,10
	Craft Support During Startup	At 3% of Total Manhours							ļ		311	MECH	66.86	20,794				20,800
	Allowance for Premium Time Labor		<u> </u>		<u> </u>				<b> </b>									Not Included Not Included
	Productivity Loss Due To Overtime Per Diem Expense																	Not Included
	Project Wrap (Efficacy) Insurance	*																Not Included
	Erection Contractor's General & Administrative Costs	At 5% of Material and Labor Costs																185,800
	Erection Contractor's Profit	At 8% of Material and Labor Costs	s 1-									=,						297,300 Included
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																mciuded w\Equipment Costs

						Louisy	/ille Gas & E	ectric								E	stimate No.	: 21983B
							ble County L										Project No.	: 10584-022
	Lundy <sup>LLC</sup>						Mitigation Sy										Date	: 12/20/2005
						5031											<del> </del>	1/27/2006
.a	go					Opt	ion 3 - Soda											: 1/27/2006
						Order of M	agnitude Co	st Estimate						L				
	Cost Type: Est = Estimated, Bid = Vendor quote					-C	ONFIDENTIA		Wage Rates				Louisville	, KY			Preparer	
					-				Labor Produ	ctivity =			1		ļ		Reviewer	:
Item No.	Description	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract s	DOR (Furnish)	<u>DOR</u> (Install)	<u>Total</u> Projected Cost
								magazinen erricki (il menine antanap turk recept) — 4 processor anno 2011 (il menine antanap turk recept)										Included
																		w\Equipment Costs
	Special Tools	Included w\Equipment Costs						The second secon						-				
	Special Tools	At 0.5% of			1													14,800
	Consumables	Equipment/Material Cost	<b> </b>															
		At 4.5% of Equipment/Material Cost	1															133,400 Not Included
	Freight To Site	Equipment/Material Cost	<del> </del>												ļ			Not included
	Taxes - Sales/Use/VAT/Business/Etc.						ŀ											By Owner
	Construction Utilities (Elect, Water, etc.) During	Furnished by Owner																by Owner
	Construction	Turnoriou by a								0	10,678			773,193				4,368,200
	SUBTOTAL INSTALLED COST																THE RESERVE OF THE PERSON OF T	
	SUBTUTAL INSTALLED COST									0								436,800
ENGINE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team	<b>_</b>		-					0								0
DEDMIT	TING MODELING, ETC.		<b>_</b>							0								50,000
521	JP, TESTING AND REAGENT (15 DAYS)	Total		<del>                                     </del>	<b>-</b>					0								971,000
fi in	IGENCY	At 20% of Total Furnished by Owner								0					ļ			100,000 Not Included
CLIENT	INTERNAL COST	Furnished by Owner								l								not included
SPARE	PARTS	Not Included																1 0
ESCAL	ATION (AFLIDC)	Not included																
INTERE	ST DURING CONSTRUCTION (AFUDC)	TOC MORECO			_					0								5,926,000
	PROJECT TOTAL :																	

						Louis	ville Gas & E	lectric							-	1	Estimate No.	: 21970B
Sargant 8	Lundy <sup>LLC</sup>					1	ble County L										Project No.	: 10584-022
icag							Mitigation Sy										Date	: 12/20/2005
-	,,,						Sodium Bist										Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co										Run Date	: 1/27/2006
	ooor Type. Lot – Lottinatou, Dia – Torius quoto				1		ONFIDENTIA		Wage Rates	Based on:			Louisville	e, KY			Preparer	:
									Labor Produ	ictivity =			1	I			Reviewer	:
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	Total Projected Co
	DUCTWORK MODIFICATIONS															-		
	MODIFY GAS DUCT TO ACCEPT INJECTION					1											1	
DW-1	NOZZLES DUCTWORK MODS		Est	1	TN	2,625.00	2,625		35.00	35	35	FLDU	89.66	3,138				5,80
	INSULATION & LAGGING	3 1/2" INSUL	Est	200	SF	8.40			0.27	54	54		59.32					4,90
													1					
DW-4	DUCTWORK SUPPORT STRUCTURES					4 000 00	0.450		16.00	80	80	STST	86.46	6,917			<u> </u>	16,40
	STRUCTURAL STEEL		Est	5 400	TN SF	1,890.00 31.50	9,450 12,600		0.40	160	160	GALL	71.2					24,00
	ACCESS & GALLERIES		Est	400	SF	31.30	12,000		0.40	100	100	- CATEL	, , , , ,	11,002	:			
							06 055				329		ļ	24,650				51,10
DW-9	DUCTWORK SUBTOTAL						26,355				329			24,000				31,10
				<u> </u>													<b></b>	
	Injection System												<u> </u>					
	EQUIPMENT/COMPONENTS												<b>l</b>					
1 -	Process Technology Package (URS). The cost	P&ID, Control Logic, Injection																
	shown here is on a single unit basis, multi-contract	and metering pump skids,											05.00	10.740				1 040 70
	or economies of scale is not included.	Proprietory injection lances 4 - CS internals - 2.0 HP / 4 -	Budget	11	EA	1,800,000.00	1,800,000		300.00	300	300	MISC	65.83	19,749				1,819,70
	D (0.01)	4 - CS internals - 2.0 HP / 4 - SS internals - 1.0 HP	Est	6	EA	2,100.00	12,600		20.00	120	120	PUMP	65.83	7,900				20,50
	Pumps (6 Qty)	62,000 gallon - D=23.4' - H=28.0'	ESI			2,100.00	12,000	and the second s					1					
	SBS Solution Tank - 1 Unit (10 Days)	SS 921,000 gallori - B-26.4 - 11-26.6	Est	1	EA	205,000.00	205,000		535.21	535	535	TANK	65.78	35,206				240,20
		Included in SoftWater supply				1 1 1 1 1 1 1 1 1			400.50		,	TANIZ	65.70	١ ,				
	Soft H <sub>2</sub> O Storage Tank - 1 Unit - (24 Hours)	system	Est	0	EA	0.00 21,000.00			489.52 30.00	30	30	TANK MECH	65.78 66.86	2,006			<b> </b>	23,00
	Agitator (1 Qty)	SS Shaft - 20 HP 2 x 100% - 50 HP	Est Est	3	EA EA	225,000.00	675,000		80.00	240	240	MECH	66.86		l		<u> </u>	691,00
	Air Compressors (2 Qty) Injection Manifold (2 Qty)	Stainless Steel	Est	0	EA	10,500.00			240.00	0	0	MECH	66.86					
	Dual Fluid Injection Nozzles (100 Qty)	Stainless Steel	Est	0	LT	21,000.00			480.00	0	0	MECH	66.86	0			-	
		L=250' - D=4" - SS / L=50' -																
	System Piping	D=4" - CS / L=50' - D=2" - SS		250	LF	30.61	7,652		0.42	105	105	SPNG	70.4	7,392			<b></b>	15,00
	6" - SS	Includes fitting allowance	Est		LF	11.89			0.42	21		SPNG	70.4	1,478				2,10
1 1	6" - CS	Includes fitting allowance	Est	50	LF LF	24.89			0.33	17		SPNG	70.4	1,162				2,40
	4" - SS	Includes fitting allowance	Est Est	50 350	LF LF	9.14			0.33	60		INSUL	53.39					6,40
	Piping Insulation & Lagging Heat Tracing		Est	350	LF	21.00			0.31	109	109	WIRE	69.06					14,80
	Valves	Allowance	Est	1	LS	2,520.00			48.00	48		SPNG	70.4	3,379				5,90
	Supply Piping			1			,											
	Water Supply	Allowance	Est	1	LS	840.00	840		100.00	100		SPNG	70.4	7,040			<b></b>	7,90
	Air Supply	Allowance	Est	1	LS	525.00			80.00	80	80		70.4	5,632				6,20
	Piping Supports	Allowance	Est	1	LS	2,940.00			112.00 16.00	112 160	112 160		70.4 86.46	7,885 13,834			<b>!</b>	10,80 35,80
	Piping Rack	Allowance INCLUDES EXCAVATION &	Est	10	TN	2,200.00	22,000		16.00	160	001	3131	00.40	13,034				35,60
ļ, <u></u>	FOUNDATIONS	BACKFILL	Est	90	CY	157.50	14,175		7.00	630	630	CONP	52.91	33,333				47,50
īs-3	STRUCTURAL STEEL	Allowance	Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834	1			35,80
				0.000	LF	10.00	22,000		0.52	1,144	1,144	PILE	82.81	94,735	1 · · · · · · · · · · · · · · · · · · ·			116,70
IS-3	AUGER CAST PILES (125 TON CAPACITY)	100 ft LONG	Est	2,200	<u> </u>	10.00	22,000		0.52	1,177	* 1, 1 TT		<u> </u>	5 1,7 00		F: .		1.0,70

<u> </u>						Louis	ville Gas & E	lectric	T	I	T.			1			stimate No.:	21970B
	LLC						ble County U										Project No.:	
	k Lundy <sup>LLC</sup>						Mitigation Sy					<u> </u>					Date:	12/20/2005
ica	go						Sodium Bisu					<u> </u>					Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co										Run Date:	1/27/2006
	Cost Type: Est = Estimated, bid = Veridor quote						ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer:	
ļ									Labor Produ	ctivity =			-	I			Reviewer:	
																7		
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR_ (Install)	<u>Total</u> <u>Projected Cos</u>
				,										***************************************				
IS-4	ROYALTY FEE	Not Included, \$ per MW, to be negotiated with Vendor	Est	0	LF									0				
IS-5	IS SYSTEM SUBTOTAL						1,020,638				3,670			261,531				1,282,000
				<u> </u>					-		<b></b>	<b> </b>	<u> </u>					
	MATERIAL UNLOADING SYSTEM				<u> </u>					***************************************			1					
ASH-1	TRUCK UNLOADING SYSTEM		Est	1 1	Set	105,000.00	105,000		1254.00	1,254	1,254	SPNG	70.4	88,282				193,300
1011-1	THOUR ONLOADING OTOTEW																	
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL						105,000		<u> </u>	<u> </u>	1,254			88,282				193,300
	AUXILIARY POWER SUPPLY SYSTEM/I&C																	
AP-1	POWER SOURCE																	
		Double Ended Unit Substation with (2) 1 MVA, 6.9-480V XFMR's	Est	1	EA	570,000.00	570,000		4228.49	4,228	4,228	EHEA	53.92	228,000				798,000
F -	SWITCHGEAR New Breaker at Existing 13.2kV Switchgear	0.9-400 V N WITS	Est	1	EA	63,000.00	63,000		100.00	100	100	EHEA	53.92	5,392				68,400
	MCC		Est	2	EA	42,000.00	84,000		200.00	400			53.92					105,600
	Misc Electrical Equipment & Controls		Est	1	LS	8,400.00	8,400		1418.55	1,419	1,419	EHEA	53.92	76,488				84,900
AP-2	GROUNDING																	
AF-Z	Cable - 500kcmil GND		Est	2,000	LF	2.10	4,200		0.05	100		WIRE	69.06					11,100
	Grounding Rod		Est	12	EA	199.50	2,394	<u> </u>	4.00	48	48	PILE	82.81	3,975				6,400
									<b>1</b>									
AP-3	CABLE Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60		Routed in 5" Conduit	0.69		0	WIRE	69.06					(
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	250	LF	14.70		Routed in 3" Conduit	0.69	173	173	WIRE	69.06					15,600
*	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	0	LF.	8.40		Routed in 2" Conduit Routed in 1-1/2"	0.35	0	0	WIRE	69.06	0				(
	Dawer Cables from Coultabaseu to TD Cata	3/C #2/0, 600V	Est	0	LF	6.30	0	Conduit	0.52	0	0	WIRE	69.06	o				(
	Power Cables from Switchgear to TR Sets Power Cables from MCC to Loads - 1 ~ 5HP	3/C #2/0, 600V	Est	200	LF	0.76	151	Routed in 3/4" Conduit	0.05	11	11	WIRE	69.06	732				900
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	LF	1.58	0	Routed in 3/4" Conduit	0.05	0	0	WIRE	69.06	0				(
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	50	LF	2.12	106	Routed in 1-1/2" Conduit Routed in 1-1/2"	0.09	5	5	WIRE	69.06	311				400
	Power Cables from MCC to Loads - 50HP	3/C #4, 600V	Est	100	LF	2.67		Conduit	0.35	35			69.06	2,417				2,700
	Power Cables from MCC to Loads - 150HP	3/C 250kcmil, 600V	Est	100	LF	3.58		Routed in 2" Conduit	0.35 0.03	35		WIRE WIRE	69.06 69.06					2,800 500
	Control Cables - Pumps	5/C #14, 600V	Est	175	LF	0.67	118	Routed in 3/4" Conduit Routed in 1-1/2"	0.03	6	6	WIKE	o9.06	387	:			500
1	Control Cables - TR Sets	7/C #14, 600V	Est	0	LF	0.81		Conduit	0.04	0		WIRE	69.06					(
	Instrumentation Cables	2 PR #16 SHLD	Est	750	LF	0.25	189	Routed in 3/4" Conduit	0.03	24	24	WIRE	69.06					. 1,800
	Data Highway Cable		Est	1,000	LF	3.15	3,150	Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06	2,210		***************************************		5,400
AP-4	RACEWAY			1	1													
AF-4	3/4" Conduit		Est	2,125	LF	2.06			0.19	412	412	ECND	49.67	20,477				24,800
	1-1/2" Conduit		Est	150	LF	4.67			0.28 0.35	43 35	43 35		49.67 49.67	2,116 1,748				2,800 2,400
	2" Conduit		Est Est	100 250	LF LF	6.25 13.13			0.35	161	161		49.67	8,009				11,300
	3" Conduit 5" Conduit		Est	0	LF	38.33			1.13	0	0	ECND	49.67	0				C
	5 Conduit																	
AP-5	DCS SYSTEM ADDITIONS					<u> </u>	<u> </u>		<u> </u>			<u> </u>						· · · · · · · · · · · · · · · · · · ·

[				T	<u> </u>	Louis	ville Gas & E	lectric		l						E	stimate No.	: 21970B
Sargent &	& Lundy <sup>LLC</sup>						ble County L										Project No.	: 10584-022
	go					SO3	Mitigation Sy	/stem									Date	12/20/2005
<u> </u>							Sodium Bisu										Rev Date	<del></del>
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co										<del> </del>	1/27/2006
						-C	ONFIDENTIA	\L- 	Wage Rates Labor Produ				Louisville	, KY			Preparer: Reviewer:	
									Labor Froda	Cuvity =							neviewer	
Item No.	Description	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	Total Projected Cos
	Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,700
	Cabillets		Lot	<u> </u>		01,000.00	01,000		40.00	-10	70	LITEA	30.32	2,107				33,700
AP-8	DCS PROGRAMMING/INTERFACE				ΕΛ	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187				0.000
	Interface Hardware Programming /Interface		Est Est	1 1	EA LT	5,250.00		3	0.00	0	0	WIRE	69.06	1,167				3,800 5,300
									450.00	450	150							
AP-9	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,800
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						804,113			-	7,476			409,070				1,213,400
	REINFORCING OF EXISTING EQUIPMENT	NONE																
	DEMOLITION / RELOCATIONS	NONE						2										
	MISCELLANEOUS	NONE		<u> </u>				)- -										
<u></u>	WHOSE LET HILLSON																	
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,675.00	3,675		1250.00	1,250	1,250	PNTR	55.58	69,475				73,200
MISC-2	ROADWORK		Est	. 0	LS	36,750.00	0		380.00	0	0	PBIT	62.43	0				(
			F4		LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-3	STORM DRAINAGE		Est	1	LO	7,330.00	7,330		300.00	300	300	ווחטוו	31.97	10,091				22,900
MISC-4	OTHER																	
	PUMP HOUSE 15' X 20'																	
									100.00	400	100			11.010				
	PREFAB BLDG. FOUNDATIONS	INCLUDES EXCAVATION & BACKFILL	Est	25	LS	38,000.00 157.50			130.00 7.00	130 175		STST	86.46 52.91	11,240 9,259				49,200 13,200
	FOUNDATIONS	BAOKFILL		25	0,										:			
MISC-5	CFD MODEL STUDY		Est	1	LS	0.00	0		40.00	40	40	STST	86.46	3,458				3,500
MISC-6	TANK BERM		Est	1	LS	75,000.00	75,000		260.00	260	260	STST	86.46	22,480				97,500
MISC-7	SOFT WATER SUPPLY SYSTEM		Est	1	LS	27,000.00	27,000		60.00	60	60	STST	86.46	5,188				32,200
MISC-8	MISC. SUBTOTAL						154,963				2,215			136,691				291,700
											-							
	GENERAL SUPPORT										·							-
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0	<u> </u>						100,000	-			100,000
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,000
	SUBTOTAL						3,911,068			o	15,243			1,039,972				4,951,200
	Craft Support During Startup	At 3% of Total Manhours									457	MECH	66.86	30,575				30,600
	Allowance for Premium Time Labor Productivity Loss Due To Overtime						·	:										Not Included Not Included

						Louis	ville Gas & E	lectric								1	Estimate No.	: 21970B
Sargent &	Lundy <sup>LLC</sup>	-				Trim	ble County l	Jnit 1									Project No.	: 10584-022
^hicag	0					SO3	Mitigation S	/stem									Date	: 12/20/2005
- T						Option 4 -	Sodium Bis	ulfite (SBS)									Rev Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co										Run Date	: 1/27/2006
	Jose Type. Lat - Latiniated, Did - Vendor quote			<del> </del>	-		ONFIDENTIA		Wage Rates	Based on:			Louisville	KV			<del> </del>	
				<u> </u>	-		CALIDEALIA	<u> </u>	Labor Produ				Louisville	, κι	-		Preparer	
			-						Labor Produ	Cuvity =							Reviewer	
ltem No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod =1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Co
	Per Diem Expense														-			Not Included
	Project Wrap (Efficacy) Insurance	At 5% of Material and Labor			<b>-</b>													Not Included
	Erection Contractor's General & Administrative	1																0.47.00
	Costs	Costs At 8% of Material and Labor			<b>4</b>					************************							ļ	247,60
1	Erection Contractor's Profit	Costs																396,10
.	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																Included w\Equipment Costs
		L. L. L. J. J. J. J. J. J. J. J. J. J. J. J. J.																Included w\Equipment
	Special Tools	Included w\Equipment Costs At 0.5% of		<b>-</b>														Costs
	Consumables	Equipment/Material Cost At 4.5% of							<u> </u>	AMERICA SECURIO DE LA CONTRACTOR DE LA C								19,60
	Freight To Site	Equipment/Material Cost		1														176,00
	Taxes - Sales/Use/VAT/Business/Etc.		<u> </u>															Not Included
(	Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner																By Owner
			ļ								15,701			1,070,547				
	SUBTOTAL INSTALLED COST				<u> </u>					U	15,701			1,070,547				5,821,10
NGINEER	RING / CONSTRUCTION MANAGEMENT	Furnished by Project Team				·				0								582,10
PERMITTII	NG, MODELING, ETC.									0								
STARTUP.	, TESTING AND REAGENT (15 DAYS)									0				-				50,00
CONTING	ENCY	At 20% of Total								0				~~~				1,290,60
CLIENT IN	TERNAL COST	Furnished by Owner								0						-		100,00
SPARE PA	ARTS								<b>_</b>	0								Not Included
ESCALATI		Not Included																
INTEREST	DURING CONSTRUCTION (AFUDC)	Not Included							-									
	PROJECT TOTAL:			1						0					I			7,843,80

[						Louis	ville Gas & E	lectric								E	stimate No.	21972B
	LLC						ble County L			_		-	\$				Project No.	10584-022
Sargent 8	Lundy <sup>LLC</sup>				<u> </u>		Mitigation Sy			_	\$		\ <u>\</u>				Date	12/20/2005
Ca	go						ption 5 - Tro		1				Š				Rev Date	1/27/2006
	Oast Time Est. Estimated Rid Vander queto		.,		<u> </u>		agnitude Co			_			§	***************************************			Run Date:	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						ONFIDENTIA		Wage Rates	Based on:	8: 6.		Louisville	KY			Preparer	
									Labor Produ	_ uctivity =			1				Reviewer	
											ž č		ž P					
Item No.	Description	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cost</u>
	DUCTWORK MODIFICATIONS									-								
	MODIFY GAS DUCT TO ACCEPT INJECTION																	
	NOZZLES								I			l		0.400				F 000
	DUCTWORK MODS INSULATION & LAGGING	3 1/2" INSUL	Est Est	1 200	TN SF	2,625.00 8.40	2,625 1,680		35.00 0.27	0 35 7 54	35 54	FLDU DINS	89.66 59.32	3,138 3,203				5,800 4,900
		0 1/2 111002																
DW-2	DUCTWORK SUPPORT STRUCTURES		Eat	5	TN	1,890.00	9,450		16.00	5 80	80	STST	86.46	6,917				16,400
	STRUCTURAL STEEL ACCESS & GALLERIES		Est Est	400	SF	31.50			0.40			GALL	71.2	11,392				24,000
	ACCESS & GALLENIES																	
DW-4	DUCTWORK SUBTOTAL						26,355				329			24,650			•	51,100
	Injection System									1								
<u> </u>	EQUIPMENT/COMPONENTS									1								
<u> </u>	Air Blowers	150 hp each	Est	6	EA	55,125.00			105.00			PUMP	65.83	41,473				372,200
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	VFD Rotary Feeder	3 hp - Stainless Steel	Est	3	EA	10,500.00	31,500		30.00	90	90	TANK	65.78	5,920				37,400
		2,687,900 lb full - 11,610 ft <sup>3</sup> - D=20.7' - H=83.0' - CS Silo - SS																
	Long-Term Storage Silo - 1 Unit (10 Days)	Hopper 268,800 lb full - 1,160 ft <sup>3</sup> - D=8.7' - H=39.0' - CS Silo - SS	Est	1	EA	304,500.00	304,500		1624.00	1,624	1,624	TANK	65.78	106,827				411,300
	Short-Term Storage Silo - (24 Hours)	Hopper	Est	1	EA	23,100.00			120.00		120	TANK	65.78	7,894				31,000
	Injection Manifold (2 Qty)	Stainless Steel	Est	2	EA	10,500.00			240.00			MECH		32,093				53,100
	Injection Nozzles (50 Qty)	Stainless Steel	Est	1	LT	10,500.00	10,500		240.00	240	240	MECH	66.86	16,046				26,500
	System Piping	Includes fitting allowance	Est	350	LF	18.48	6,468		0.46	160	160	SPNG	70.4	11,236				17,700
	8" - CS	includes fitting allowance	Est	0	LF	6.62			0.14	il c		INSUL	53.39	0				0
	Piping Insulation & Lagging Heat Tracing		Est	0	LF	0.00	0		0.00	) c	0	WIRE	69.06	0				0
	Valves	Allowance	Est	1	LS	1,050.00	1,050		24.75	25	25	SPNG	70.4	1,742				2,800
	Supply Piping				<b></b>	040.00			100.00	1		SPNG	70.4	0				
	Water Supply	Allowance	Est	0	LS	840.00 525.00			100.00			SPNG		0				<u>\</u>
	Air Supply	Allowance	Est Est	0	LS LS	1,575.00			60.00		60	SPNG	70.4	4,224				5,800
	Piping Supports Piping Rack	Allowance Allowance	Est	10	TN	2,200.00			16.00	160	160	STST	86.46	13,834				35,800
	Fibility Hack	INCLUDES EXCAVATION &										ا	50.00	00.000				4= ===
IS-2	FOUNDATIONS	BACKFILL	Est	90	CY	157.50			7.00			CONP	52.91	33,333				47,500
	STRUCTURAL STEEL		Est	10	TN	2,200.00	22,000		16.00	160	160	STST	86.46	13,834				35,800
IS-3	AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	2,200	LF	10.00	22,000		0.52	1,144	1,144	PILE	82.81	94,735				116,700
							810,618			1	5,522			383,190				1,193,600
IS-4	IS SYSTEM SUBTOTAL									]								
	MATERIAL UNLOADING SYSTEM								<u> </u>									
10011	TRUCK LINE CARING SYSTEM	Included in silo	Est	0	Set	105,000.00	0		1254.00	o	0	SPNG	70.4	0				
	TRUCK UNLOADING SYSTEM	IIIOIUUGU III SIIO			1						0			0				n n
AH-6	MATERIAL UNLOADING SYSTEM SUBTOTAL		<u> </u>	<u> L</u>	<u> L</u>	<u>La ilanda de la calenda de la</u>	<u> </u>		<u> </u>			es estemblish	<u> </u>	<u>U</u>		<u> </u>	1	<u> </u>

						Louis	ville Gas & E	lectric									Estimate No.	21972B
Sargent &	Lundy <sup>LLC</sup>		<u> </u>			Trim	ble County l	Jnit 1		-							Project No.	10584-022
icac							Mitigation Sy			-							Date	12/20/2005
F	3						ption 5 - Tro										Rev Date	1/27/2006
<del>                                     </del>	Cost Type: Est = Estimated, Bid = Vendor quote	3 1					agnitude Co										Run Date	1/27/2006
	Cost Type: Lat - Latiniated, Did - Tender quote		<del> </del>				ONFIDENTIA		Wage Rates	Based on:			Louisville	, KY			Preparer	:
					<del>                                     </del>				Labor Produ	- ictivity =		-	1				Reviewer	:
			1	<u> </u>						9 65 5 7 6 5 7		2002	Ş					
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	<u>Crew</u> <u>Code</u>	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract s	DOR (Furnish)	DOR (Install)	Total Projected Cos
																	ļ	
1 1	AUXILIARY POWER SUPPLY SYSTEM/I&C												_					
AP-1	POWER SOURCE																	
		Double Ended Unit													ľ	· .		
	4007 074170110545	Substation with (2) 1MVA, 6.9-480V XFMR's	Est	1	EA	570,000.00	570,000		4280.00	4,280	4.280	EHEA	53.92	230,778		*		800,80
	480V SWITCHGEAR New Breaker at Existing 4160V Switchgear	U.J-40UV ALIVILI 9	Est	1	EA	63,000.00			100.00	100	100	EHEA EHEA	53.92	5,392	***************************************		1	68,40
	MCC		Est	2	EA	42,000.00	84,000		200.00	400	400	EHEA	53.92	21,568				105,60
	Misc Electrical Equipment & Controls		Est	1	LS	60,900.00	60,900		1434.00	1,434	1,434	EHEA	53.92	77,321				138,20
AP-2	GROUNDING				2.5							l		0.000		`		
	Cable - 500kcmil GND Grounding Rod		Est Est	2,000 12	LF EA	2.10 199.50			0.05 4.00			WIRE PILE	69.06 82.81	6,906 3,975				11,10 6,40
AD 0	CARLE			<u> </u>												100		
1/	CABLE Power Cables for MCC's	3/C 750kcmil, 5kV	Est	0	LF	33.60		Routed in 5" Conduit	0.69	0	0	WIRE	69.06	0				
	Power Cables for MCC's	3/C 500kcmil, 600kV	Est	250	LF	14.70		Routed in 3" Conduit	0.69	173	173	WIRE	69.06	11,913				15,600
	Power Cables for 480V Switchgear	3/C 4/0kcmil, 5kV	Est	250	LF	8.40	2,100	Routed in 2" Conduit Routed in 1-1/2"	0.35	88	88	WIRE	69.06	6,043				8,10
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V	Est	0	LF	6.30		Conduit	0.52	0	0	WIRE	69.06	0				
	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V	Est	150	LF	0.76		Routed in 3/4" Conduit Routed in 3/4" Conduit	0.05 0.05	გ	8	WIRE	69.06 69.06	549		· · · · · · · · · · · · · · · · · · ·		70
	Power Cables from MCC to Loads - 15HP	3/C #8, 600V	Est	0	LF	1.58	U	Routed in 1-1/2"	0.05	Ų	<u>_</u>	winc.	09.00	U				
	Power Cables from MCC to Loads - 50 HP	3/C #4, 600V	Est	150	LF	2.10	315	Conduit Routed in 1-1/2"	0.09	14	14	WIRE	69.06	932				1,20
	Power Cables from MCC to Loads - 100HP	3/C #4/0, 600V	Est	150	LF	9.45		Conduit	0.50	75	75	WIRE	69.06					6,600
	Power Cables from MCC to Loads - 150HP	3/C #350, 600V	Est	900	LF	10.50		Routed in 2" Conduit	0.69		621	WIRE	69.06	42,886				52,30
	Control Cables - Pumps	5/C #14, 600V	Est	150	LF LF	0.67		Routed in 3/4" Conduit	0.03	5		WIRE	69.06 69.06	332				400
	Control Cables - TR Sets	7/C #14, 600V	Est	750	LF LF	0.81 0.25		Routed in 1-1/2" Routed in 3/4" Conduit	0.04 0.03	0 24		WIRE	69.06	1,657			<u> </u>	1,800
	Instrumentation Cables Data Highway Cable	2 PR #16 SHLD	Est Est	750 1,000	LF LF	3.15		Routed in 3/4" Conduit	0.03	32 32	32	WIRE	69.06	2,210				5,400
AP-4	RACEWAY			1														
	3/4" Conduit		Est	2,300	LF	2.06			0.19		446	ECND		22,163				26,900
	1-1/2" Conduit		Est	300	LF	4.67			0.28	85	85	ECND	49.67	4,232				5,600
	2" Conduit		Est	1,150	LF_	6.25 13.13			0.35 0.65	405 581	405	ECND ECND	49.67 49.67	20,106 28,833				27,300 40,600
	3" Conduit		Est Est	900	LF LF	38.33			1.13	ວດ! ດ		ECND	49.67	20,033 1				40,000
	5" Conduit		ESI	J 0		30.33			1.10	, in the second			.0.07					
AP-5	DCS SYSTEM ADDITIONS					04 500 00	01.500		40.00	40	40	EHEA	53.92	2,157				00 700
	Cabinets		Est	1 1	EA	31,500.00	31,500		40.00	40	40	спеа	53.92	2,157				33,700
	DCS PROGRAMMING/INTERFACE		<del> </del>	<del> </del>	EA	2,625.00	2,625		20.00	20	20	EHEC	59.36	1,187				3,800
	Interface Hardware Programming /Interface		Est Est	1	LT	5,250.00			0.00	0	0	WIRE	69.06	0				5,300
	LIGHTING ALLOWANCE		Est	1 1	LT	10,500.00	10,500		100.00	100	100	INEL	60.02	6,002				16,500
							880,012				9,077			502,322				1,382,300
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL				ļ		000,012				3,077							1,002,000

[						Louis	ville Gas & E	lectric								E	Estimate No.:	21972B
Sargent &	& Lundy <sup>LLC</sup>					Trim	ble County L	Init 1									Project No.:	
ica	go					SO3	Mitigation Sy	stem									Date:	12/20/2005
l —							ption 5 - Tro											1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote					Order of M	agnitude Co	st Estimate					Š				Run Date:	1/27/2006
	La company of the second secon						ONFIDENTIA		Wage Rates	Based on:			Louisville	e, KY			Preparer:	
									Labor Produ	uctivity =			1		J		Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	<u>DOR</u> (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
	REINFORCING OF EXISTING EQUIPMENT	NONE										905						
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE					-			-					·			
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	3,150.00	3,150	-	1170.00	1,170	1,170	PNTR	55.58	65,029	1.27			68,200
MISC-2	ROADWORK		Est	0	LS	36,750.00	0		380.00	o c	0	PBIT	62.43	0				C
MISC-3	STORM DRAINAGE		Est	1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,900
MISC-4	OTHER																	
	BLOWER HOUSE																	
	PREFAB BLDG (15' x 20' )	INCLUDES EXCAVATION &		1	LS	38,000.00			130.00			STST	86.46	11,240				49,200
	FOUNDATIONS	BACKFILL	Est	25	CY	157.50	3,938		7.00	175	175	CONP	52.91	9,259				13,200
MISC-5	MISC. SUBTOTAL						52,438				1,775			101,119				153,500
	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		o							100,000				100,000
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			100,000				100,000
	SUBTOTAL						1,769,423			0	16,703			1,111,281	-			<b>2,880,500</b>
	Craft Support During Startup Allowance for Premium Time Labor	At 3% of Total Manhours									501	MECH	66.86	33,504				33,500 Not Included
	Productivity Loss Due To Overtime Per Diem Expense		,															Not Included Not Included
	Project Wrap (Efficacy) Insurance Erection Contractor's General & Administrative	At 5% of Material and Labor																Not Included
	Costs Erection Contractor's Profit	Costs At 8% of Material and Labor																144,000 230,400
		Costs														-		Included w\Equipment
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs						· · · · · · · · · · · · · · · · · · ·										Costs Included w\Equipment
	Special Tools	Included w\Equipment Costs At 0.5% of						· · · · · · · · · · · · · · · · · · ·										Costs
	Consumables	Equipment/Material Cost	<u> </u>	1	1	<u> </u>	<u> </u>		<u> I</u>		Ŀ	r (Carlotte			ļ			8,800

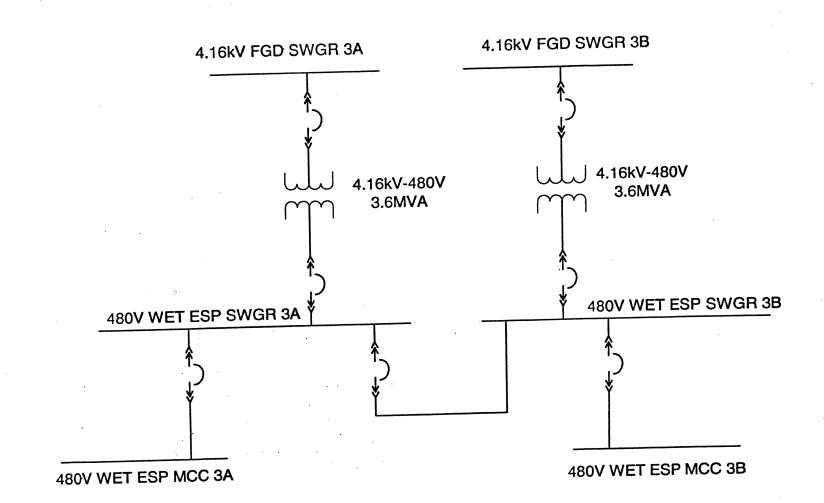
					Louis	ville Gas & E	lectric								1	Estimate No.:	: 21972B
Sargent & Lundy <sup>LLC</sup>					Trin	ble County	Jnit 1			*		\				Project No.:	: 10584-022
Chicago						Mitigation S			_							<u> </u>	: 12/20/2005
						ption 5 - Tro										<del></del>	1/27/2006
Cost Type: Est = Estimated, Bid = Vendor quote						lagnitude Co			-	*			<u> </u>	-			: 1/27/2006
and Type: Lot - Lottinated, Dia - Toridor quote			-			ONFIDENTI		Wage Rates			KSENZZENARE Konnervenzer	Louisville	100				<b>_</b>
				-		ONFIDENTI	<b>1</b>	Labor Produ		<u> </u>		Louisville	, N.	ļ		Preparer:	
								Labor Produ	ictivity =	<u> </u>		1				Reviewer:	
Item No. <u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract s	DOR (Furnish)	DOR (Install)	Total Projected Co
	At 4.5% of							****									
Freight To Site	Equipment/Material Cost																79,6
Taxes - Sales/Use/VAT/Business/Etc.				<b></b>													Not Included
Construction Utilities (Elect, Water, etc.) During Construction	Furnished by Owner					-											By Owner
SUBTOTAL INSTALLED COST									] (	17,204			1,144,784	-			3,376,8
FNONESCHIOLOGICAL CONTRACTOR OF THE LET		<b>_</b>	<u> </u>	<b> </b>													
ENGINEERING / CONSTRUCTION MANAGEMENT PERMITTING, MODELING, ETC.	Furnished by Project Team		<b></b>	<b>-</b>												<b> </b>	337,7
STARTUP REAGENT TESTING (15 DAYS)		<b>-</b>		-					,	1							50.0
CONTINGENCY	At 20% of Total							<del>-  </del>	}								50,0 752,9
CLIENT INTERNAL COST	To Be Furnished by Owner			1				<u> </u>	l č								100,0
SPARE PARTS						;			l c								Not Included
ESCALATION	Not Included																
INTEREST DURING CONSTRUCTION (AFUDC)	Not Included																
		ļ		ļ													
PROJECT TOTAL :		L	<u> </u>		1				C	1						1 '	4,617,

	T				1	Louis	ville Gas & E	lectric	:							1	Estimate No.:	21973B
	110					1	ble County U										Project No.:	10584-022
	& Lundy <sup>LLC</sup>						Mitigation Sy										Date:	12/20/2005
' hica	go						Horizontal F										Rev Date	1/27/2006
<u> </u>						1	agnitude Co							:			Run Date	1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote								Wage Rates	Based on:	1		Louisville	KY		<del> </del>	Preparer:	
						-0	ONFIDENTIA	<b>1</b>	Labor Produ				1	, KI			Reviewer:	
									Labor Produ	Cuvity =						1	TICTICITO!	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> Projected Cos
																		-
	DUCTWORK MODIFICATIONS	COSTS																
<u> </u>	DOCTWORK MODIFICATIONS	000.0																
									ļ									
	WESP & ASSOCIATED EQUIP																ļ	
						4											<b>_</b>	
	passages, and 11 feet long 2nd and 3rd fields at 11.75" spacing with 64 passages, total 170 SCA. All internal 2205, with 2205 carbon steel clad alloy plate	ASSOCIATED DUCTWOR, MODAL STUDY, WASTE WATER EQUIPMENT,PIPING AND				00.400.000.00		BUDGETARY INPUT	142817	142,817	142,817	PRFC	86.72	12,385,047				42,875,000
WE-1	construction)	TANKS	Est	1	EA	30,490,000.00	30,490,000	FROM VENDOR	142817	142,017	142,017	PREC	00.72	12,363,047		1.		42,073,000
									1									
	Chimney Liner Adjustment ( WITH MODIFIED	RETURN TO EXISTING	Est	0	LF.	5,302.50	٥ ،		55	0	0	PREC	86.72	0			1	1 (
WE-2	BREECHING AT WESP OUTLET ELEVATION)	BREECHING	ESI	0	L	3,302.30												
			Est	0	LS	21,000.00	0		220	0	0	PREC	86.72	0	**************************************			(
` <u>3</u>	Chimney Breaching Adjustment		ESI	1	1	21,000.00												
		20'x40'	Est	1	EA	21,000.00	21,000		100.00	100	100	STST	86.46	8,646				29,600
WÉ-4	Electrical Building	20 X40	LU														!	
		INCLUDES EXCAVATION &													ŀ		1	
WE-5	FOUNDATIONS	BACKFILL	Est	810	CY	157.50			7.00	5,670		CONP	52.91	300,000				427,600
	STRUCTURAL STEEL		Est	170	TN	2,200.00	374,000		16.00	2,720	2,720	STST	86.46				<u> </u>	609,200
WE-7	AUGER CAST PILES (120 TON CAPACITY)	100 ft LONG	Est	2,000	LF	10.00	20,000		0.52	1,040		PILE	82.81	86,122				106,100
WE-7	FIBER GLASS DUCT 23' DIA		Est	450	LF	7,200.00	3,240,000		50.00	22,500	22,500	DUCT	59.32	1,334,700			<b>-</b>	4,574,700
	WE SYSTEM SUBTOTAL						34,272,575				174,847			14,349,686		-	<u> </u>	48,622,200
	AUXILIARY POWER SUPPLY																	
	SYSTEM/I&C																	
AD 4	POWER SOURCE																	
AP-1		Double Ended Unit				41											1	
		Substation with (2) 2MVA, 6.9								=		-,,-,	F0 00	00.000			1	600.00
	SWITCHGEAR	480V XFMR's	Est	1 1	EA	575,000.00			500.00	500 100	500 100	EHEA EHEA	53.92 53.92	26,960 5,392			<b> </b>	602,000 68,400
	New Breaker at Existing 13.2kV Switchgear	<u> </u>	Est	1	EA	63,000.00			100.00	100	100	EHEA	53.92	5,392 25,882			<b> </b>	130,900
1	MCC		Est	2	EA	52,500.00			240.00 324.00	480 324	480	EHEA	53.92	25,662 17,470	:			103,600
	Misc Electrical Equipment & Controls		Est	1	LS	86,100.00	86,100		324.00	324	324	LIILA	JU.32	17,470				100,000
AP-2	GROUNDING											MACO	60.00	0.000		:	<u> </u>	44.40
	Cable - 500kcmil GND		Est	2,000	LF	2.10			0.05	100 48	100 48	WIRE PILE	69.06 82.81	6,906 3,975			<b> </b>	11,100 6,400
	Grounding Rod		Est	12	EA	199.50	2,394		4.00	48	48	FILE	02.01	3,873				0,400
AP-3	CABLE						0.000	Routed in 5" Conduit	0.69	69	60	WIRE	69.06	4,765				8,100
	Power Cables for MCC's	3/C 750kcmil, 5kV	Est	100	LF	33.60 14.70		Routed in 3" Conduit	0.69	09		WIRE	69.06	7,735			J	0,.50
	Power Cables for MCC's	3/C 500kcmil, 5kV	Est	0	LF LF	8.40		Routed in 2" Conduit	0.03	350	350	WIRE	69.06	24,171		<u> </u>		32,600
	Power Cables for Switchgear	3/C 4/0kcmil, 5kV	Est	1,000	Lr_	0.40	0,400	Routed in 1-1/2"	"									
4		0/0 #0/0 6007/	Est	2,400	LF	6.30	15.120	Conduit	0.52	1,248	1,248	WIRE	69.06	86,187				101,300
	Power Cables from Switchgear to TR Sets	3/C #2/0, 600V 3/C #10, 600V	Est	0	<del>│                                    </del>	0.76	0	Routed in 3/4" Conduit	0.05	0	0	WIRE	69.06	0				C
<u> </u>	Power Cables from MCC to Loads - 1 ~ 5HP	3/C #10, 600V 3/C #8, 600V	Est	1,500	LF	1.58		Routed in 3/4" Conduit	0.05	80	80	WIRE	69.06	5,490			<b></b>	7,900
ļ	Power Cables from MCC to Loads - 15HP	σιο πο, οσο <b>ν</b>		1				Routed in 1-1/2"				I				1	1	_
	Power Cables from MCC to Loads - 20 ~ 30 HP	3/C #6, 600V	Est	0	LF	2.12	0	Conduit	0.09	0	0	WIRE	69.06	0			<u> </u>	. 0

						Louis	ville Gas & E	lectric								E	stimate No.:	21973B
Courant 9	Lundy LLC					Trim	ble County l	Jnit 1									Project No.:	10584-022
Sargent &							Mitigation S										<del> </del>	12/20/2005
7. Ť							Horizontal F							-				1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote						agnitude Co											1/27/2006
			7			-C	ONFIDENTIA	AL-	Wage Rates				Louisville	e, KY			Preparer:	
					ļ				Labor Produ	ctivity =	<u> </u>	<u> </u>	1 1				Reviewer:	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	Crew Code	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract <u>s</u>	DOR (Furnish)	DOR (Install)	<u>Total</u> <u>Projected Cos</u>
			V					Routed in 1-1/2"										
			F-4	0	LF	2.67		Conduit	0.35	0	,	WIRE	69.06	6				
		3/C #4, 600V 3/C #2, 600V	Est Est	0	LF	3.58	C	Routed in 2" Conduit	0.35	Ö	d	WIRE	69.06	0				
		5/C #14, 600V	Est	1,500	LF	0.67	1,008	Routed in 3/4" Conduit	0.03	48	48	WIRE	69.06	3,315				4,30
	COMMON COLUMN TO THE COLUMN TH							Routed in 1-1/2"				MIDE						l
	Control Capito 111 Coto	7/C #14, 600V	Est	2,400	LF LF	0.81 0.25	1,940	Conduit Routed in 3/4" Conduit	0.04 0.03	96 24			69.06 69.06					8,60 1,80
	Instrumentation Cables	2 PR #16 SHLD	Est Est	750 1,000	LF LF	3.15		Routed in 3/4" Conduit	0.03	32	32	WIRE	69.06					1,80 5,40
	Data Highway Cable		ESI	1,000	<del> </del>	0.10	3,.50											
AP-4	RACEWAY										000	FOUR	40.00	, AF 3-1				
	3/4" Conduit		Est	4,750	LF	2.06			0.19 0.28	922 682		ECND ECND	49.67 49.67					55,500 45,100
	1-1/2" Conduit		Est	2,400	LF LF	4.67 6.25			0.28	352	352	ECND	49.67					23,70
	2" Conduit		Est Est	1,000	<del>  LF</del>	13.13			0.65	002	C	ECND	49.67					20,70
	3" Conduit 5" Conduit		Est	100	LF	38.33			1.13	113	113	ECND	49.67	5,598				9,40
	DCS SYSTEM ADDITIONS Cabinets		Est	1	EA	31,500.00	31,500		40.00	40	40	EHEA	53.92	2,157				33,70
AP-8	DCS PROGRAMMING/INTERFACE				- FA	0.605.00	2,625		20.00	20	20	EHEC	59.36	1,187				3 80
	Interface Hardware		Est	1 1	EA LT	2,625.00 5,250.00			0.00	0	20	WIRE	69.06	1,107				3,80 5,30
	Programming /Interface		Est	<del>                                     </del>	<u> </u>	0,200.00										-		
AP-9	LIGHTING ALLOWANCE		Est	1	LT	15,750.00	15,750		150.00	150	150	INEL	60.02	9,003				24,80
Ar-9	EIGHTING ALLOWANGE											<u> </u>						
AP-10	AUXILIARY POWER SYSTEM / I&C SUBTOTAL						957,418				5,776			336,065				1,293,70
1	REINFORCING OF EXISTING	NONE																
	<u>EQUIPMENT</u>	v																
	DEMOLITION / RELOCATIONS	NONE																
	MISCELLANEOUS	NONE									-							
MISC-1	PAINTING	Touch-up and Field Finish	Est	1	LS	87,150.00	87,150		3250.00	3,250	3,250	PNTR	55.58	180,635				267,80
IVIIOUT	FAIRTING																	
MISC-2	ROADWORK	20' WIDTH X 1000 LF GRAVEL	Est	1	LS	45,937.50	45,938		380.00	380	. 380	PBIT	62.43	23,723				69,70
	STORM DRAINAGE		Est	1 1	LS	7,350.00	7,350		300.00	300	300	YDRN	51.97	15,591				22,90
MISC-3	5 I URIVI DRAIIVAGE																	
MISC-4	OTHER																	
			1				140,438				3,930			219,949	·			360,40
MISC-5	MISC. SUBTOTAL						1 10,100											
ļ <u> </u>	OFNEDAL CUPDODT		1															
ļ	GENERAL SUPPORT																	
GS-1	MOBILIZATION / DEMOBILIZATION		Est	1	LT		0							100,000	2			100,000
301					1		<u> </u>		L							-		

<u> </u>				T .		Louis	ville Gas & E	lectric								. 1	Estimate No	.: 21973B
Cargont !	& Lundy <sup>LLC</sup>					Trim	ble County l	Jnit 1									Project No	.: 10584-022
	go						Mitigation S										Date	e: 12/20/2005
	lgo l					Option 7 -	Horizontal F	low WESP									Rev Date	1/27/2006
	Court To Cation and Did Manday must						agnitude Co										Run Date	e: 1/27/2006
	Cost Type: Est = Estimated, Bid = Vendor quote			-			ONFIDENTIA		Wage Rates	Based on:			Louisville	. KY		-	Preparei	
					-		ON IDENTIA	<b>1.</b>	Labor Produ		<b> </b>		1				Reviewe	
																	, nonene	
Item No.	<u>Description</u>	Scope Definition	Cost Type	Quantity	Unit of Measure	Unit Equip./ Mat. Cost	Total Equipment or Material Cost	Cost Development	Unit Man- hours (Base)	Total Man- hours (Base)	Total Man- hours, Prod = 1	<u>Crew</u> <u>Code</u>	Crew Wage Rate	Total Construction & Erection Cost	Sub- Contract	DOR (Furnish)	DOR (Install)	Total Projected Cos
	:																	
GS-2	CRANE RENTAL	700 Ton - 2 months	Est	1	LT		O	Includes freight in and out						310,000				310,000
GS-2	GENERAL SUPPORT SUBTOTAL						0				0			410,000				410,000
							05 070 404				184,553			15 215 700			<u> </u>	50,000,00
	SUBTOTAL						35,370,431				104,553			15,315,700				50,686,30
	Craft Support During Startup	At 3% of Total Manhours		1	-						5,537	MECH	66.86	370,176				370,20
	Allowance for Premium Time Labor	At 578 Of Total Marinodic		1														Not Included
	Productivity Loss Due To Overtime																	Not Included
	Per Diem Expense																<u> </u>	Not Included
100	Project Wrap (Efficacy) Insurance				<u> </u>													Not Included
	Erection Contractor's General & Administrative	At 5% of Material and Labor Costs - WESP						·				ŀ						1,009,80
<u> </u>	Costs	At 8% of Material and Labor		1														1,000,00
	Erection Contractor's Profit	Costs - WESP															1	1,615,70
	Mandatory Spare Parts (Start-up/Testing)	Included w\Equipment Costs																Included w\Equipment Costs Included
												e e e						w\Equipment
	Special Tools	Included w\Equipment Costs								***************************************								Costs
	openial resid	At 0.5% of															ŀ	
	Consumables	Equipment/Material Cost		<u> </u>	ļ		<u> </u>							·			<u> </u>	176,90
		At 4.5% of Equipment/Material Cost															ľ	1,591,70
	Freight To Site Taxes - Sales/Use/VAT/Business/Etc.	Equipment/Material Cost			1													Not Included
1	Construction Utilities (Elect, Water, etc.) During																	
	Construction	Furnished by Owner									·							By Owner
											190,089			15,685,876				55,450,60
	SUBTOTAL INSTALLED COST										100,000			10,000,010				33,430,00
ENCINE	ERING / CONSTRUCTION MANAGEMENT	Furnished by Project Team		1						0								2,495,00
PERMIT	FING, MODELING, ETC.	Tarriorios of Frojost Foam								0								
	P AND TESTING									0								100,000
CONTIN	GENCY	At 20% of Total		ļ	<b></b>					0							<b> </b>	11,609,100 200,000
CLIENT I	NTERNAL COST	To Be Furnished by Owner			1					<u>0</u>								Not Included
SPARE F	PARTS	Not Included	<u> </u>	<b></b>	1												:	(
ESCALA	TION ST DURING CONSTRUCTION (AFUDC)	Not Included Not Included		-	1	<b></b>								-				
HINTERES	DUMING CONSTRUCTION (APODC)	Trot mondou		1	1													
	PROJECT TOTAL:									0							<u> </u>	69,854,700

#### TYPICAL FOR UNIT 1, 3 AND UNIT 4



Equipment	QTY	1	Power Source
First Field Recirc Water Pumps	3	<i>I</i>	480 MCC
Second Field Recirc Water Pumps	3	1	480 MCC
Third Field Recirc Water Pumps	3		480 MCC
Misting Recirc Water Pumps	3		480 MCC
Make-up Water Pumps	3		480 MCC
T/R Set	12	120KVA	480 Switchgear

New 4.16kV Swgr supplied as part of the new FGD modification. New aux power system is expected to be designed to support these requirements. All power and control cable to support the use of the FGD 4kV Switchgear in the responsibility of this estimate. 4kV breaker is supplied, but assume all relaying and current transformers required are not included.

Low voltage loads will be evenly across both 480V SWGR and MCC buses.

REV 0	DATE 12-09-05	PREPARED BTC	REVIEWED	DRAWING RELEA	SE RECORD  PURPOSE  RELEASED FOR PRELIMINARY LAYOUT	NONE PROJECT NUMBER	PRELIMINARY LAYOUT  GHENT UNIT 3	Sargent & Lundy w	£	
						10584-022	WET ESP SYSTEM	DWG CLASS: SK-G1-WE-22 SHEET 1 OF 1	O REV.	

Project No. 10584-022 January 27, 2006

#### 8.2: First Year O&M Costs

### PLANT INFORMATION

Cost Analysis Parameter	lnite	Ammonia	Hydrated	Humidification	Magnesium	Magnesium	Micronized	Sodium	-	4-4-4-0	000
		Bulling	Lime	Water	Hydroxide	Oxide	Limestone	BiSulfite	Lona	Soda Asn	Werest
Unit Net Capacity	MM	511	511	511	511	511	511	511	511	511	511
Capacity Factor	%	80	80	80	80	80	80	8	80	80	G C
SO <sub>3</sub> Before Treatment	lb/hr	846.0	846.0	846.0	846.0	846.0	846.0	846.0	846.0	846.0	634.0
Required Removal	wt%	06	06	:	06	06	S	6	90	OB	G
SO3 Removed by Treatment	lb/hr	762.4	762.4	;	762.4	762.4	762.4	762.4	762.4	769.4	571.4
O&M COST INFORMATION											
Cost Analysis Parameter	Units	Ammonia	Hydrated	Humidification	Magnesium	Magnesium	Micronized	Sodium	1	1 4 7 6	100
	2	Di Di	Lime	Water	Hydroxide	Oxide	Limestone	BiSuffite	Lona	Soda Ash	Wet ESP
Chemical Molar Stoichiometric Ratio		1.25	10.00	1	7.00	7.00	2.00	2.00	3.00	1.00	100
Chemical Use	lb/hr	202.5	7,062.1	0.0	3,869.4	2,668.6	6.671.4	2.401.7	6.461.7	10102	416.4
Unit Chemical Cost	\$/dry ton	\$300	\$109	\$0	\$210	\$450	\$30	\$200	\$205	\$220	\$210
Yearly Chemical Cost	ક	\$212,894	\$2,697,286	0\$	\$2,847,263	\$4,207,778	\$701,296	\$1.785,311	\$4,641,580	\$880.973	\$306.400
Softened Water Consumption	mdb	0.0	0.0	75.0	38.7	0,0	75.0	43.2	0.0	18.2	0.0
Unit Softened Water Cost	\$/kgal	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06
Yearly Softened Water Cost	æ	\$0	\$0	\$1,766	\$910	\$0	\$1,766	\$1.017	\$0	\$428	90
Auxiliary Power Need (Total Installed Equipment)	ΚŅ	40	98	110	280	20	310	130	340	130	3.500
Unit Auxiliary Power Cost	\$/MW-h	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87
Additional Outage Cost	\$/MW-h	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59
Yearly Auxiliary Power Cost	ş	\$7,137	\$15,166	\$19,627	\$49,959	\$12,490	\$55,311	\$23,195	\$60,664	\$23,195	\$624.483
O&M Labor	man-hours	333	999	333	999	999	999	999	999	999	333
O&M Labor Cost	\$/man-hour	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40
Yearly Oxivi Cost	s	\$13,312.00	\$26,624.00	\$13,312.00	\$26,624.00	\$26,624.00	\$26,624.00	\$26,624.00	\$26,624.00	\$26,624.00	\$13,312.00
Subtotal	ۍ	\$233,342	\$2,739,076	\$34,705	\$2,924,756	\$4,246,892	\$784,998	\$1,836,147	\$4,728,868	\$931,220	\$944,195

## PLANT INFORMATION

LG&E/KU Ghent 4

Cost Analysis Daramater	olidi	Amenda	Hydrated	Humidification	Magnesium	Magnesium	Micronized	Sodium			
	Cillis	שווווסוווומ	Lime	Water	Hydroxide	Oxide	Limestone	BiSulfite	Lona	Soda Ash	Wetesp
Unit Net Capacity	MM	511	511	511	511	511	+ 55	511	54.4	511	511
Capacity Factor	%	80	98	80	80	80	80	08	80	8	S S
SO <sub>3</sub> Before Treatment	lb/hr	846.0	846.0	846.0	846.0	846.0	846.0	846.0	846.0	846.0	634.0
Required Removal	wt%	06	06	:	06	6	6	06	06	G	06
SO3 Removed by Treatment	lb/hr	762.4	762.4	1	762.4	762.4	762.4	762.4	762.4	762.4	5714
O&M COST INFORMATION											
Cost Analysis Parameter	1 Inite	Ammonia	Hydrated	Humidification	Magnesium	Magnesium	Micronized	Sodium		1.4	201.77
	OI IIIS	Bullouin	Lime	Water	Hydroxide	Oxide	Limestone	BiSulfite	Lona	Soda Asn	Wellesh
Chemical Molar Stoichiometric Ratio		1.25	10.00		7.00	7.00	7.00	2.00	3.00	1.00	1.00
Chemical Use	lb/hr	202.5	7,062.1	0.0	3,869.4	2,668.6	6.671.4	2.401.7	6.461.7	1,010,2	416.4
Unit Chemical Cost	\$/dry ton	\$300	\$109	\$0	\$210	\$450	\$30	\$200	\$205	\$220	\$210
Yearly Chemical Cost	æ	\$212,894	\$2,697,286	0\$	\$2,847,263	\$4,207,778	\$701,296	\$1.785.311	\$4.641.580	\$880.973	\$306.400
Softened Water Consumption	dbm	0.0	0.0	75.0	38.7	0.0	75.0	43.2	0.0	18.2	0.0
Unit Softened Water Cost	\$/kgal	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06
Yearly Softened Water Cost	*	\$0	\$0	\$1,766	\$910	\$0	\$1,766	\$1,017	\$0	\$428	\$0
Auxiliary Power Need (Total Installed Equipment)	kW	40	85	110	280	70	310	130	340	130	3.500
Unit Auxiliary Power Cost	\$/MW-h	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87
Additional Outage Cost	\$/MW-h	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59
Yearly Auxiliary Power Cost	æ	\$7,137	\$15,166	\$19,627	\$49,959	\$12,490	\$55,311	\$23,195	\$60,664	\$23,195	\$624.483
O&M Labor	man-hours	333	999	333	999	999	999	999	999	999	333
O&M Labor Cost	\$/man-hour	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40
Yearly O&M Cost	\$	\$13,312.00	\$26,624.00	\$13,312.00	\$26,624.00	\$26,624.00	\$26,624.00	\$26,624.00	\$26.624.00	\$26,624.00	\$13.312.00
Subtotal	49	\$233,342	\$2.739.076	\$34.705	\$2 924 756	\$4 246 892	\$784 agg	\$1 B36 147	\$4 728 868	¢034 220	\$04A 105

## Economic Evaluation

PLANT INFORMATION

LG&E/KU Mil Greek

								A STATE OF THE PERSON NAMED IN COLUMN 2 IN	The second secon	the state of the s	And in case of the last of the
Cost Analysis Parameter	Units	Ammonia	Hydrated	Humidification	Magnesium	Magnesium	Micronized	Sodium	Trona	Soda Ash	Wet ESP
			Lime	Water	Hydroxide	Oxide	Limestone	BiSulfite			
Unit Net Capacity	MW	386	386	386	386	386	386	386	386	386	386
Capacity Factor	%	80	08	80	80	80	80	80	80	80	80
SO <sub>3</sub> Before Treatment	lb/hr	511.0	511.0	511.0	511.0	511.0	511.0	511.0	511.0	511.0	345.0
Required Removal	wt%	87	87		87	87	87	87	87	87	87
SO3 Removed by Treatment	lb/hr	443.1	443.1	:	443.1	443.1	443.1	443.1	443.1	443.1	299.1
O&M COST INFORMATION											
Cost Analysis Parameter	1 Inite	Ammonia	Hydrated	Humidification	Magnesium	Magnesium	Micronized	Sodium		200	0000
	O III	BIIDIIII	Lime	Water	Hydroxide	Oxide	Limestone	BiSuffite	rona	Soda Asn	Wel ESP
Chemical Molar Stoichiometric Ratio	***	1.25	10.00	:	7.00	7.00	7.00	2.00	3.00	1.00	1.00
Chemical Use	lb/hr	117.7	4,103.8	0.0	2,248.5	1,550.7	3,876.7	1,395.6	3.754.9	587.0	218.0
Unit Chemical Cost	\$/dry ton	\$300	\$109	\$0	\$210	\$450	\$30	\$200	\$205	\$220	\$210
Yearly Chemical Cost	€9	\$123,711	\$1,567,371	\$0	\$1,654,521	\$2,445,105	\$407,518	\$1,055,242	\$2,697,184	\$529.739	\$160,403
Softened Water Consumption	mdb	0.0	0.0	75.0	22.5	0.0	75.0	25.1	0.0	10.6	0.0
Unit Softened Water Cost	\$/kgal	\$0.08	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06
Yearly Softened Water Cost	*	0\$	\$0	\$1,766	\$529	\$0	\$1.766	\$591	\$0	\$249	\$0
Auxiliary Power Need (Total Installed Equipment)	kW	40	85	110	280	22	310	130	340	130	3.500
Unit Auxiliary Power Cost	\$/MW-h	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87
Additional Outage Cost	\$/MW-h	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8 50	\$8.50	\$8.50
Yearly Auxiliary Power Cost	€9	\$7,137	\$15,166	\$19,627	\$49,959	\$12,490	\$55,311	\$23.195	\$60.664	\$23.195	\$624.483
O&M Labor	man-hours	333	999	333	999	999	999	999	999	999	333
O&M Labor Cost	\$/man-hour	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40
Yearly O&M Cost	\$	\$13,312.00	\$26,624.00	\$13,312.00	\$26,624.00	\$26,624,00	\$26,624,00	\$26,624.00	\$26,624.00	\$26,624,00	\$13.312.00
Subtotal	49	\$144,160	\$1.609.161	\$34.705	\$1,731,633	\$2.484.219	\$491219	\$1 105 652	\$2 784 472	\$579 RUE	\$798 198

#### LG&E/KU Mill Creek 4

# Economic Evaluation

PLANT INFORMATION											
Cost Analysis Parameter	Units	Ammonia	Hydrated Lime	Humidification Water	Magnesium Hvdroxide	Magnesium Oxide	Micronized	Sodium	Trona	Soda Ash	Wet ESP
Unit Net Capacity	MW	490	490	490	490	490	490	490	UBP	490	490
Capacity Factor	%	80	80	80	80	80	08	08	80	8	08
SO <sub>3</sub> Before Treatment	lb/hr	545.0	545.0	545.0	545.0	545.0	545.0	545.0	545.0	545.0	364.0
Required Removal	wt%	85	85	:	85	85	85	85	85	85	85
SO3 Removed by Treatment	lb/hr	465.9	465.9	***	465.9	465.9	465.9	465.9	465.9	465.9	311.2
O&M COST INFORMATION											
Cost Analysis Parameter	Units	Ammonia	Hydrated	Humidification	Magnesium	Magnesium	Micronized	Sodium	Trend	And obe	001 40/84
			Lime	Water	Hydroxide	Oxide	Limestone	BiSulfite	RUOL	Soda Asn	WELESP
Chemical Molar Stoichiometric Ratio		1.25	10.00		7.00	7.00	7.00	000	300	1 00	00 -
Chemical Use	lb/hr	123.8	4,315.8	0.0	2,364.6	1,630.8	4.077.0	1.467.7	3.948.8	617.4	226.8
Unit Chemical Cost	\$/dry ton	\$300	\$109	0\$	\$210	\$450	\$30	\$200	\$205	\$220	\$210
Yearly Chemical Cost	<del>\$</del>	\$130,102	\$1,648,350	\$0	\$1,740,004	\$2,571,434	\$428,572	\$1,126,574	\$2,836,537	\$573,919	\$166.877
Softened Water Consumption	mdb	0.0	0.0	75.0	23.6	0.0	75.0	26.4	0.0		0.0
Unit Softened Water Cost	\$/kgal	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06
Yearly Softened Water Cost	49	\$0	\$0	\$1,766	\$556	\$0	\$1,766	\$621	9	\$261	Ş
Auxiliary Power Need (Total Installed Equipment)	κW	40	85	110	280	70	310	130	340	130	3.500
Unit Auxiliary Power Cost	\$/MW-h	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87
Additional Outage Cost	\$/MW-h	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59
Yearly Auxiliary Power Cost	49	\$7,137	\$15,166	\$19,627	\$49,959	\$12,490	\$55,311	\$23,195	\$60,664	\$23,195	\$624.483
O&M Labor	man-hours	333	999	333	999	999	999	999	999	999	333
O&M Labor Cost	\$/man-hour	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40
Yearly O&M Cost	89	\$13,312.00	\$26,624.00	\$13,312.00	\$26,624.00	\$26,624.00	\$26,624.00	\$26,624.00	\$26,624.00	\$26,624.00	\$13,312.00
Subtotal	æ	\$150,551	\$1,690,140	\$34,705	\$1,817,143	\$2,610,548	\$512,274	\$1,177,014	\$2,923,825	\$624,000	\$804.672
						A		-			ı

LG&E/KU Trimble Cou

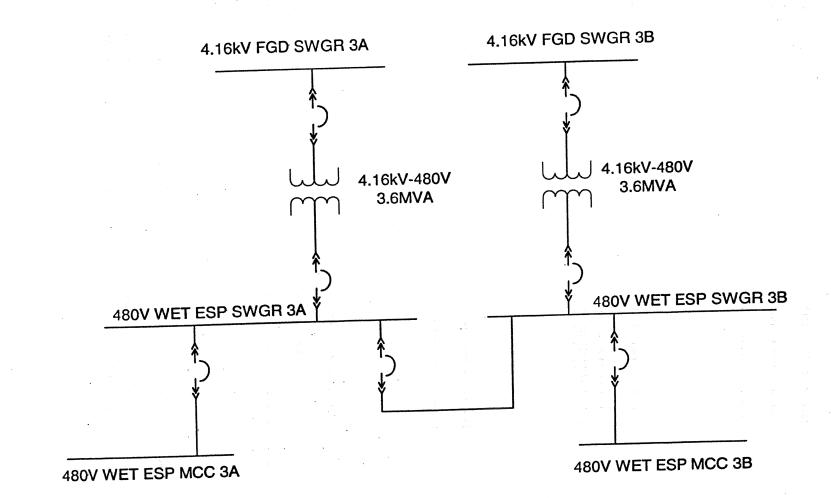
# Economic Evaluation

PLANT INFORMATION											
Cost Analysis Parameter	Units	Ammonia	Hydrated Lime	Humidification Water	Magnesium Hydroxide	Magnesium Oxide	Micronized Limestone	Sodium BiSulfite	Trona	Soda Ash	Wet ESP
Unit Net Capacity	MW	495	495	495	495	495	495	495	495	495	495
Capacity Factor	%	80	80	80	80	80	80	88	80	80	80
SO <sub>3</sub> Before Treatment	lb/hr	877.0	877.0	877.0	877.0	877.0	877.0	877.0	877.0	877.0	610.0
Required Removal	wt%	06	06		06	06	06	8	06	06	90
SO3 Removed by Treatment	lb/hr	792.8	792.8	1	792.8	792.8	792.8	792.8	792.8	792.8	551.4
O&M COST INFORMATION											
Cost Analysis Parameter	Units	Ammonia	Hydrated Lime	Humidification Water	Magnesium Hydroxide	Magnesium Oxide	Micronized Limestone	Sodium BiSulfite	Trona	Soda Ash	Wet ESP
Chemical Molar Stoichiometric Ratio		1.25	10.00	;	7.00	7.00	7.00	2:00	3.00	1.00	1.00
Chemical Use	lb/hr	210.6	7,343.1	0.0	4,023.4	2,774.7	6,936.8	2,497.3	6,718.8	1,050.4	401.8
Unit Chemical Cost	\$/dry ton	\$300	\$109	\$0	\$210	\$450	\$30	\$200	\$205	\$220	\$210
Yearly Chemical Cost	\$	\$221,364	\$2,804,599	\$0	\$2,960,543	\$4,375,187	\$729,198	\$1,849,075	\$4,826,248	\$908,757	\$295,695
Softened Water Consumption	mdb	0.0	0.0	75.0	40.2	0.0	75.0	44.9	0.0	18.9	0.0
Unit Softened Water Cost	\$/kgal	90.0\$	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06	\$0.06
Yearly Softened Water Cost	\$	0\$	\$0	\$1,766	\$946	80	\$1,766	\$1,057	\$0	\$445	\$0
Auxiliary Power Need (Total Installed Equipment)	kW	04	85	110	280	70	310	130	340	130	3,500
Unit Auxiliary Power Cost	\$/MW-h	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87	\$16.87
Additional Outage Cost	\$/MW-h	65.8\$	\$8.59	69'8\$	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59
Yearly Auxiliary Power Cost	\$	\$7,137	\$15,166	\$19,627	\$49,959	\$12,490	\$55,311	\$23,195	\$60,664	\$23,195	\$624,483
O&M Labor	man-hours	333	999	333	999	. 999	999	999	999	999	333
O&M Labor Cost	\$/man-hour	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40	\$40
Yearly O&M Cost	\$	\$13,312.00	\$26,624.00	\$13,312.00	\$26,624.00	\$26,624.00	\$26,624.00	\$26,624.00	\$26,624.00	\$26,624.00	\$13,312.00
Subtotal	\$	\$241,813	\$2,846,389	\$34,705	\$3,038,072	\$4,414,301	\$812,899	\$1,899,951	\$4,913,536	\$959,021	\$933,490

Ghent 1

OHIO RIVER EXTSE REVEN TO CHES STORT RIVER . C OF ABSORBER UNIT 1 SORBENT INJECTION GRID 27 3 5 7 -UNIT 1 SORBENT STORAGE SILO OR TANK SECONDARY CONTAINMENT FOR LIQUID SORBENTS <u>PLAN</u> DATE RELEASED SCALE: 1" = 100'-0" GENERAL ARRANGEMENT
SITE PLAN
SO3 MITIGATION STRATEGY STUDY
EQUIPMENT ARRANGEMENT
GMENT UNIT 1 GHTSO3GAO1

#### TYPICAL FOR UNIT 1, 3 AND UNIT 4



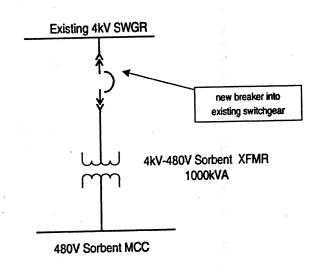
Equipment	QTY		Power Source
First Field Recirc Water Pumps	3		480 MCC
Second Field Recirc Water Pumps	3		480 MCC
Third Field Recirc Water Pumps	3		480 MCC
Misting Recirc Water Pumps	3	Ľ	480 MCC
Make-up Water Pumps	3		480 MCC
T/R Set	12	120KVA	480 Switchgear

New 4.16kV Swgr supplied as part of the new FGD modification. New aux power system is expected to be designed to support these requirements. All power and control cable to support the use of the FGD 4kV Switchgear in the responsibility of this estimate. 4kV breaker is supplied, but assume all relaying and current transformers required are not included.

Low voltage loads will be evenly across both 480V SWGR and MCC buses.

		DRAWING RELEA	ASE RECORD	SCALE		$\mathcal{A}$	!
-		APPROVED	PURPOSE	NONE	PRELIMINARY LAYOUT	Sargent & Lundy	/uc
	REV         DATE         PREPARED         REVIEWED           0         12-09-05         BTC	AFFIIOVED	RELEASED FOR PRELIMINARY LAYOUT	PROJECT NUMBER	GHENT UNIT 3		•
	0 12 00 00 3.0			10584-022		DWG CLASS:	REV.
					WET ESP SYSTEM	SK-G1-WE-22	0
						SHEET 1 OF 1	

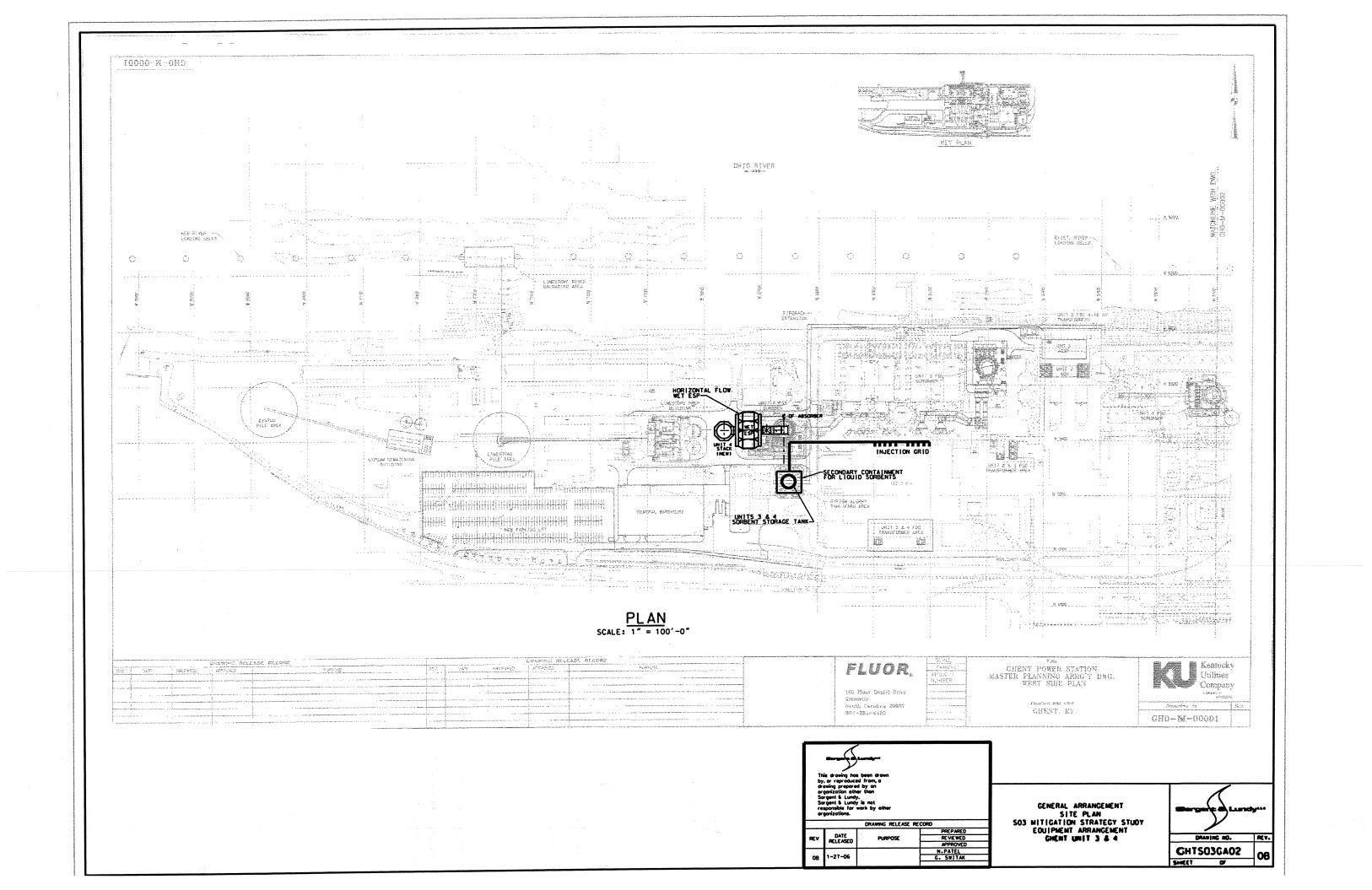
#### TYPICAL FOR UNIT 1, 3 AND UNIT 4

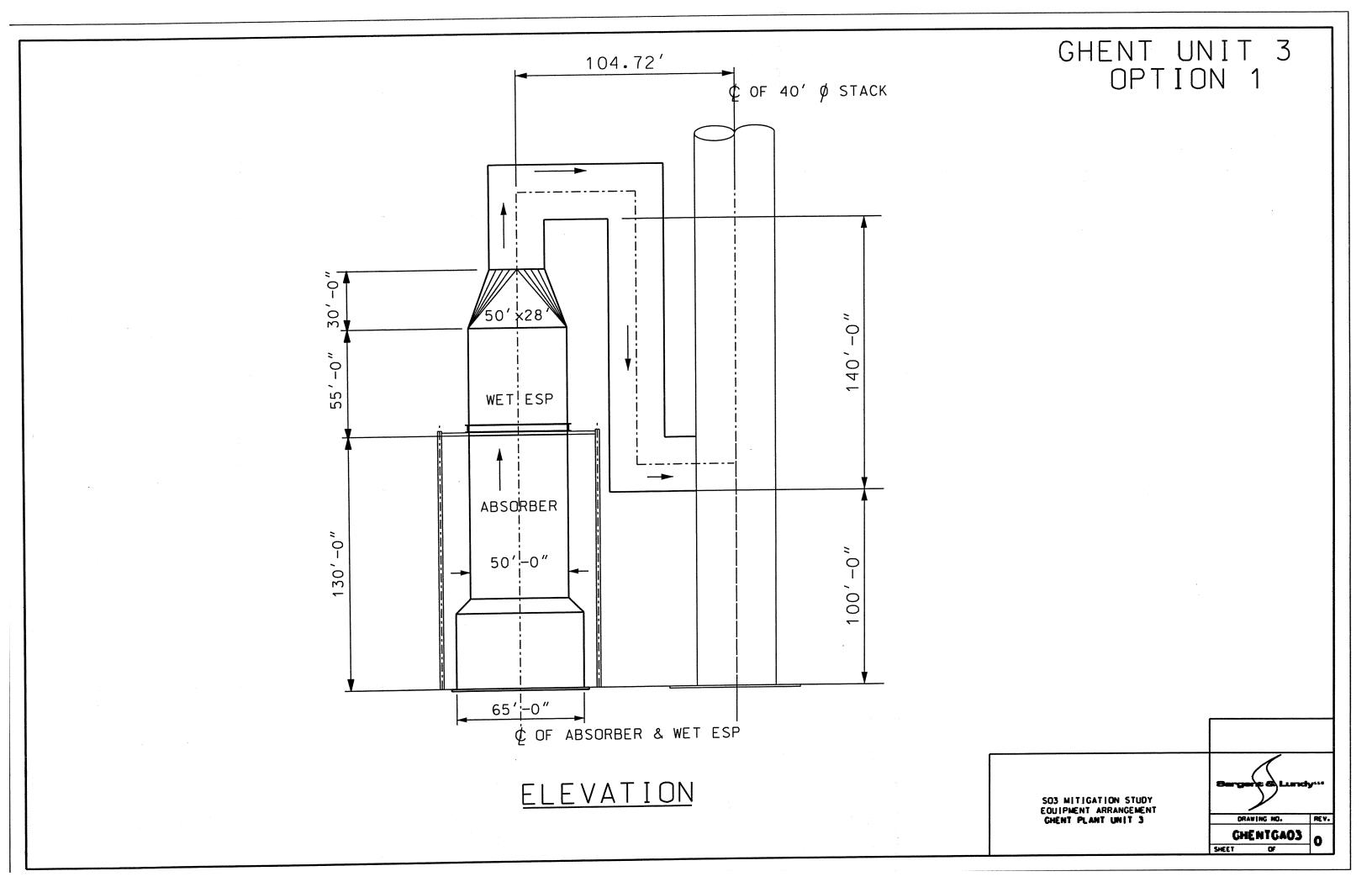


Description Description	HP	units	QTY
Convey Air Blower Motor	250	hp	2
Blower Enclosure Fan Motor	10	hp	2
Hydraulic Duty Pump Motor	25	hp	1
Hydraulic Standby Motor	25	hp	1
Hydraulic Recirculation Pump Motor	10	hp	1
Dust Collector Fan Motor	10	hp	2
Dust Collector Rotory Feeder Motor	10	hp	1
Hydraulic Cooling Fan Motor	10	hp	1
Silo Screw Feeder Motor	25	hp	1
Weigh Bin Rotory Feeder Motor	10	hp	2
Airlock Rotory Feeder Motor	10	hp	2
Glycol Duty Pump Motor	25	hp	1
Glycol Standby Pump Motor	25	hp	1
Chiller Motor	10	hp	7
Desicant Wheel Reg Fan Motor	1	hp	2
Desicant Wheel Drive Motor	2	hp	2
Desicant Wheel React Heater	24	kw	. 2
Main Elevator Motor	50	hp	1
Transformer 480:208V Lighting/HVAC 3 phase	28	kva	1
Transformer 480:120/240V Control 1 phase	50	kva	1
HVAC Exhaust Fan Motor	7.5	hp	2
HVAC Supply Fan Motor	7.5	hp	2
HVAC Blower Heater	5	kw	4
HVAC Blower Heater	10	kw	4

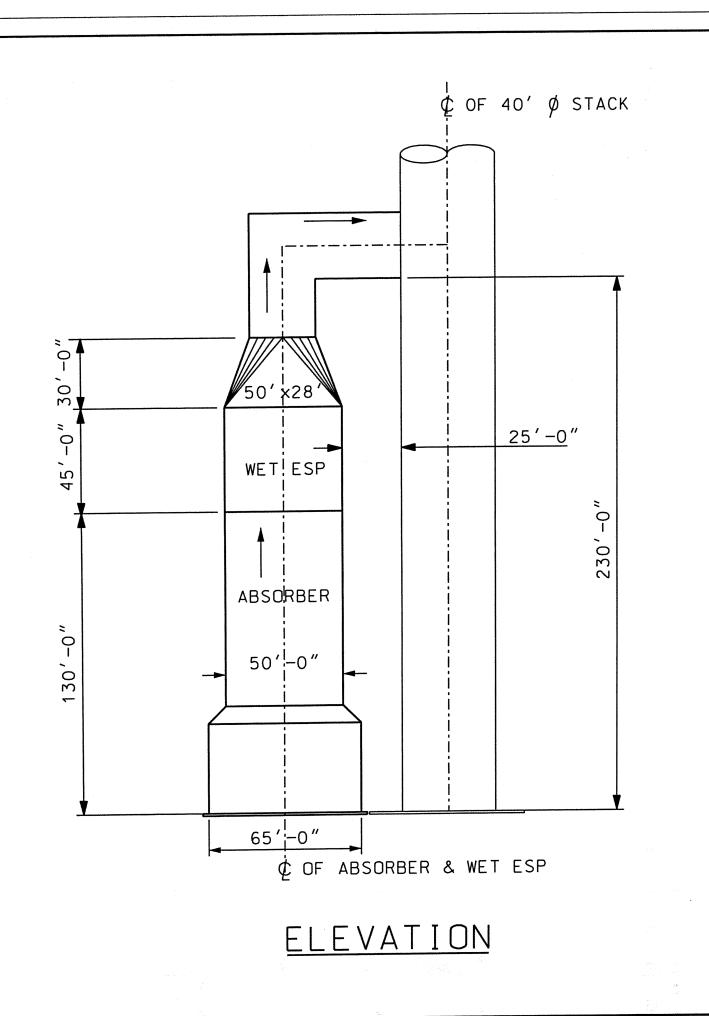
	DRAWer RELEASE RECORD						SCALE			
REV	DATE	PREPARED	REVIEWED	APPROVED	PURPOSE		NONE PROJECT	PRELIMINARY LAYOUT	Sargeht & Lundy	Anc
	12-09-05	втс			RELEASED FOR PRELIMINARY LAYOUT		NUMBER	GHENT UNIT 3		
	and the					The second second	10584-022	GILLIVI ONIT O	DWG CLASS:	R
	Ev 20	_	e Roder s					SORBENT INJECTION SYSTEM		
									SK-G3-SI-22	╝.
				1 2 2					SHEET 1 OF 1	1

### 9: Drawings Ghent 3





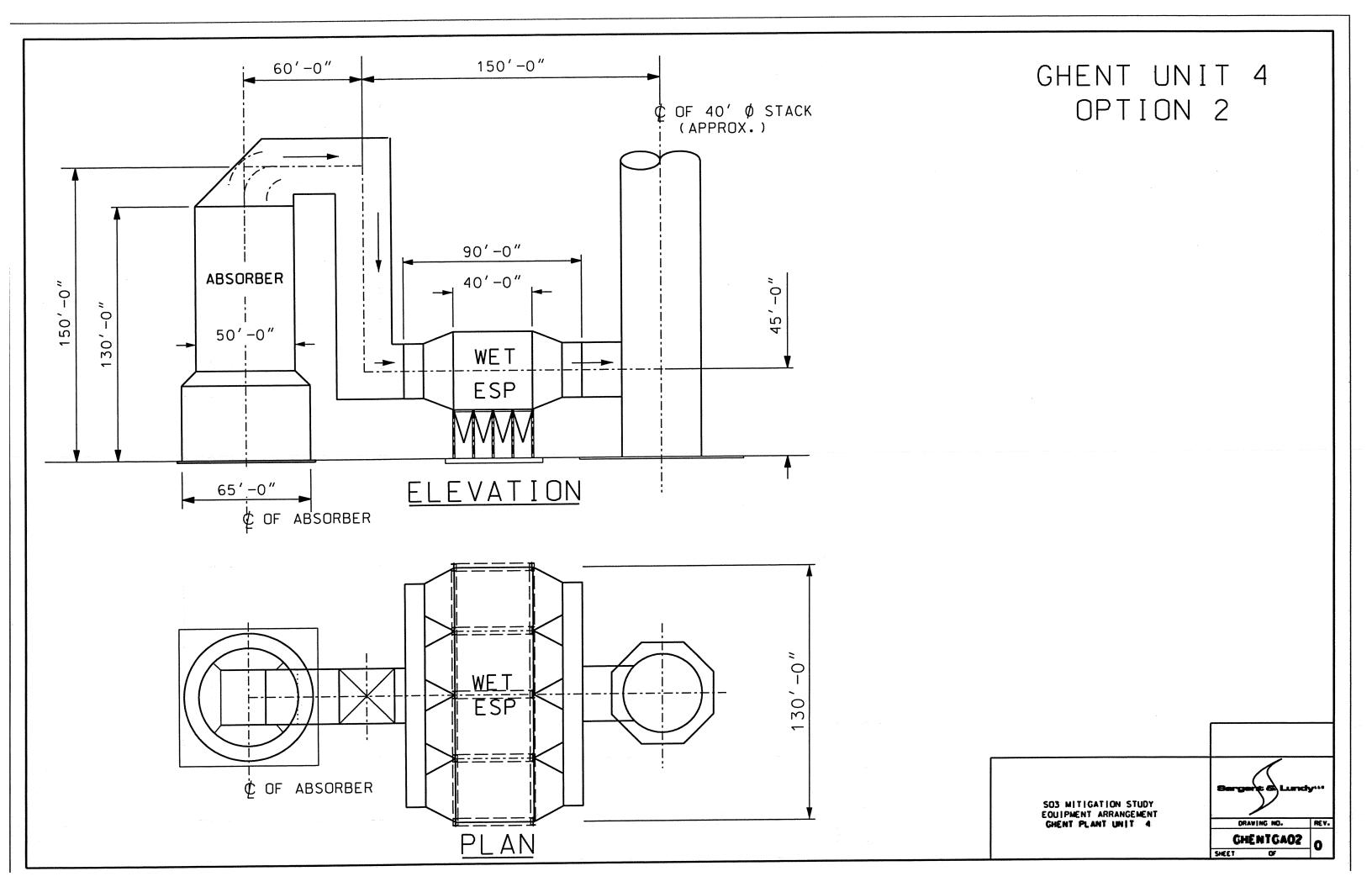
Ghent 4



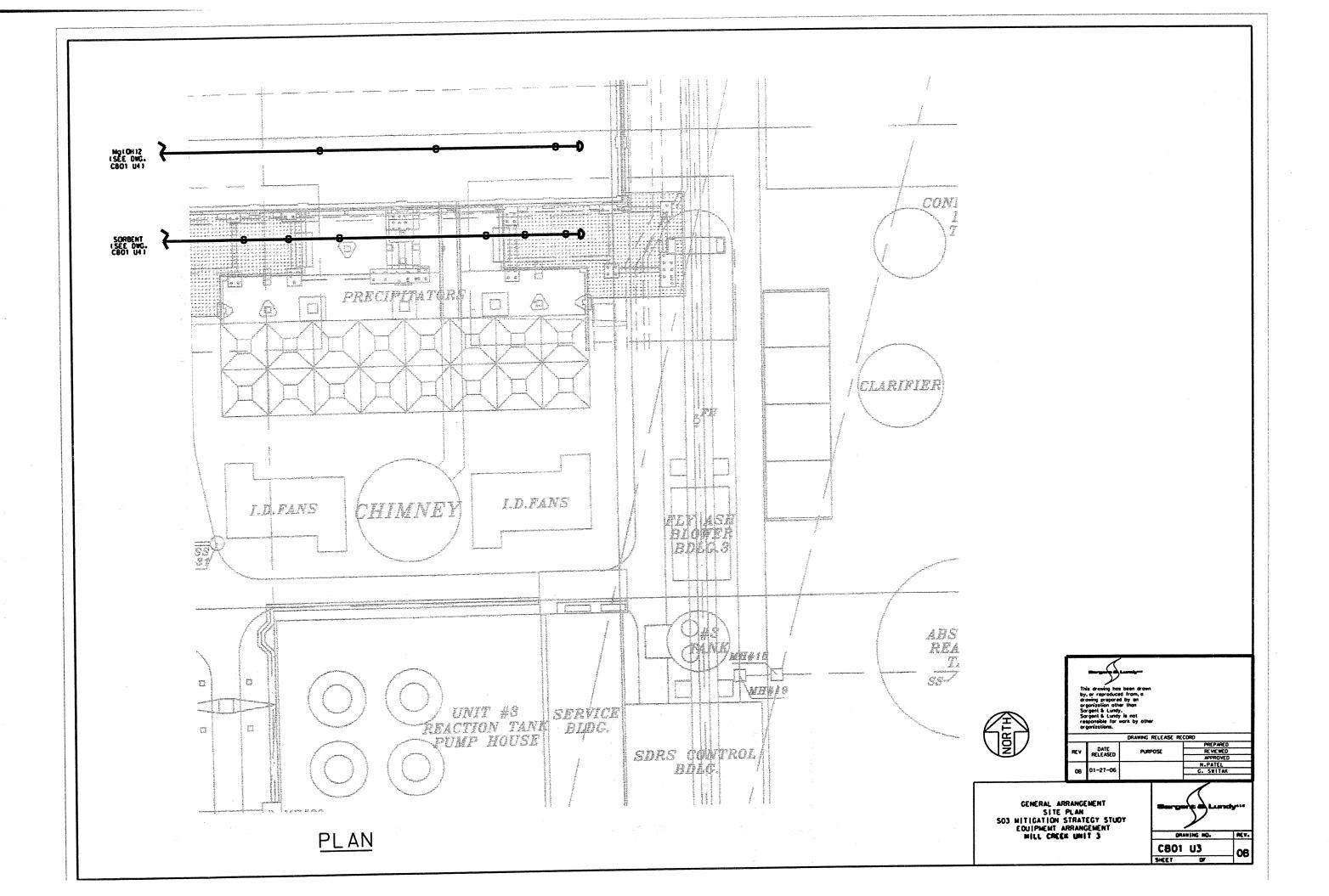
GHENT UNIT 4 OPTION 1

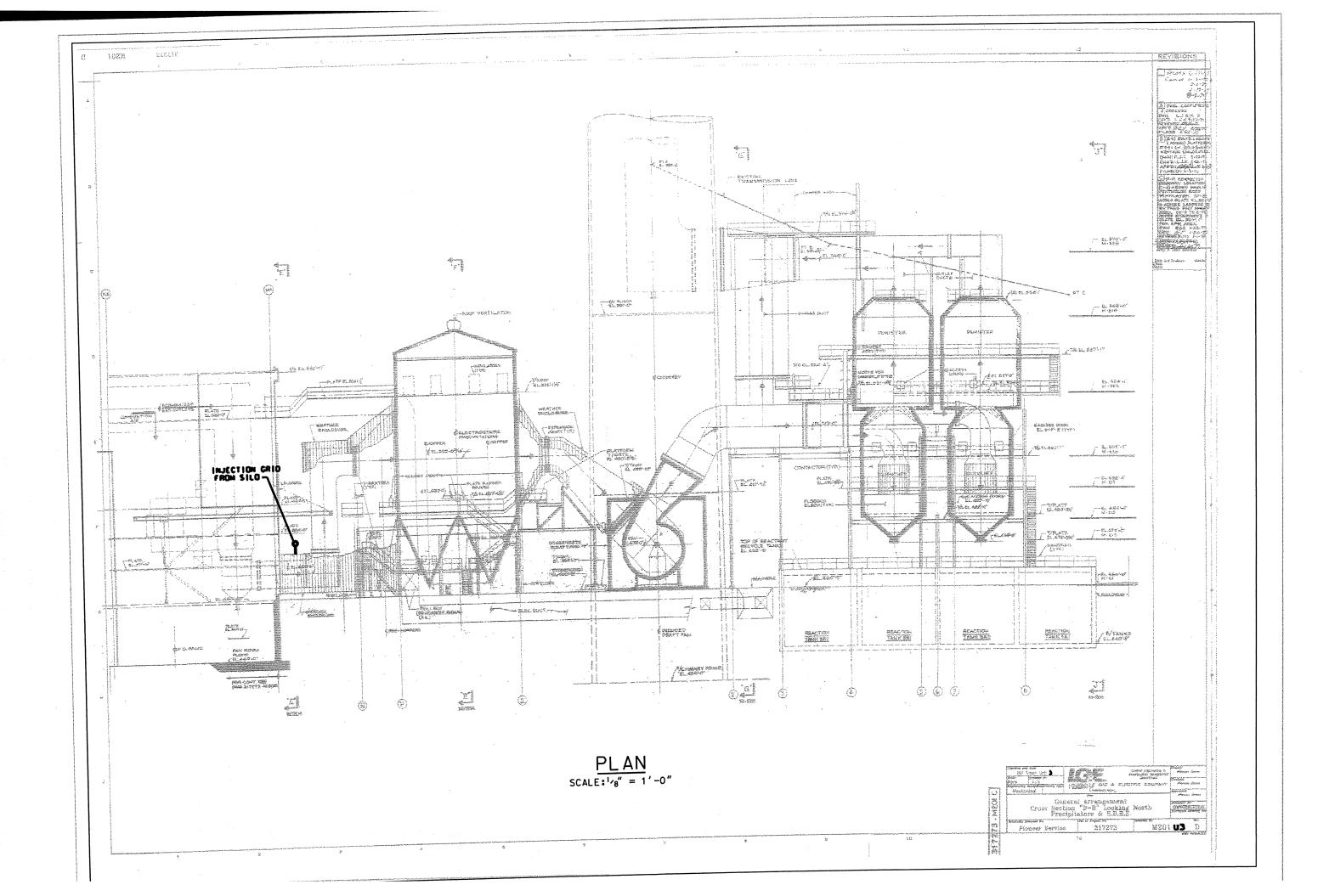
SO3 MITIGATION STUDY EQUIPMENT ARRANGEMENT GHENT PLANT UNIT 4

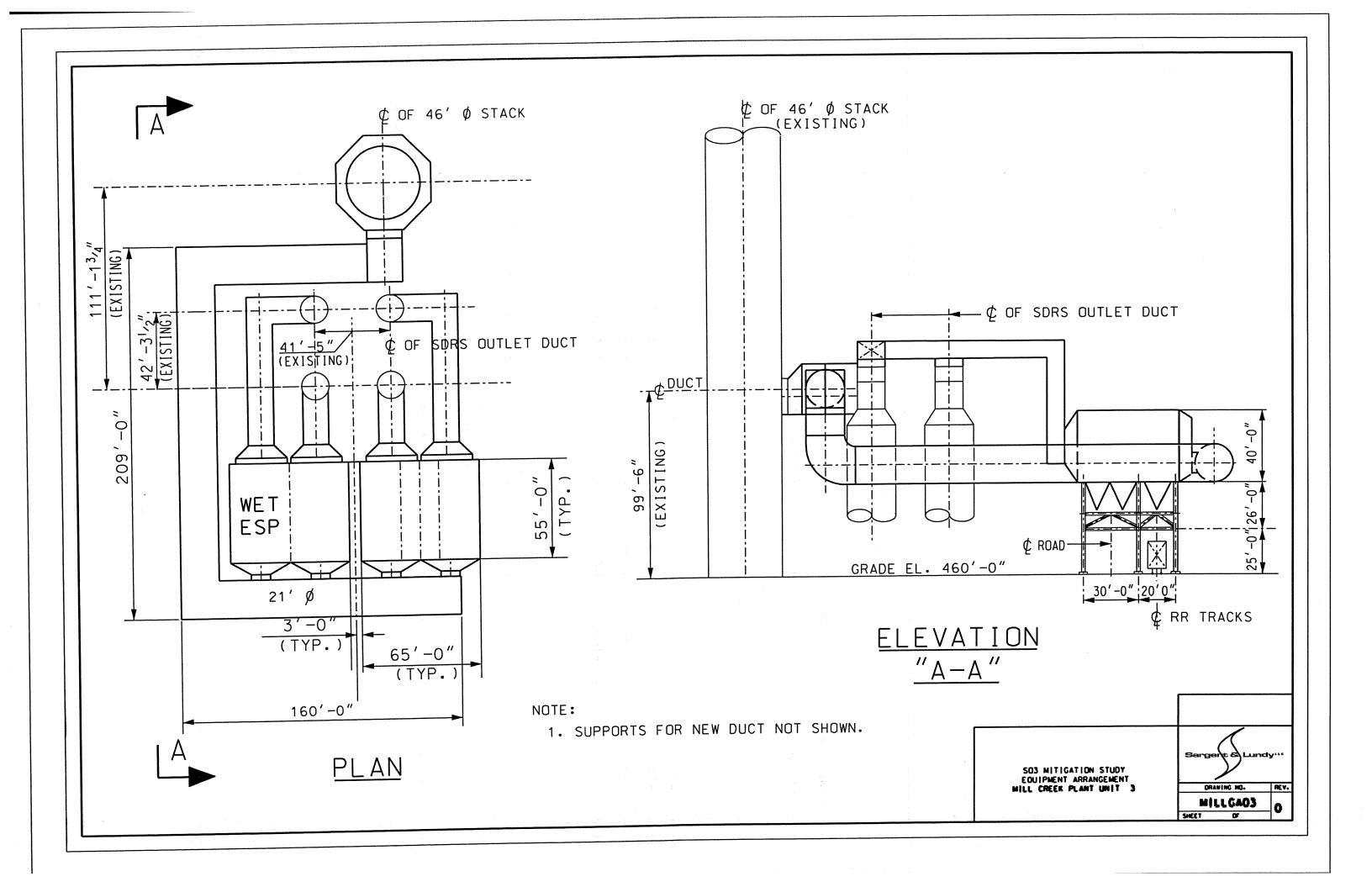
CHENTGAO1



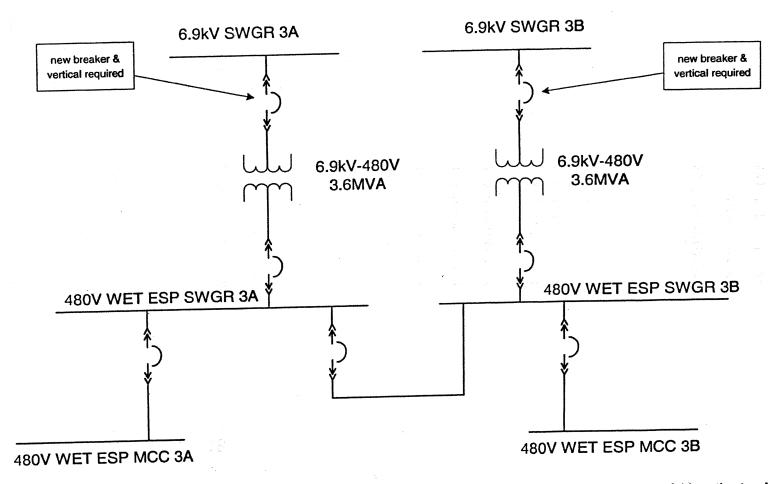
Mill Creek 3







#### TYPICAL FOR BOTH UNIT 3 AN D UNIT 4



Equipment	QTY	HP -	Power Source
First Field Recirc Water Pumps	3		480 MCC
Second Field Recirc Water Pumps	3	·	480 MCC
Third Field Recirc Water Pumps	3		480 MCC
Misting Recirc Water Pumps	3		480 MCC
Make-up Water Pumps	3		480 MCC
T/R Set	12	120KVA =	480 Switchgear

New 6.9kV Swgr vertical sections, breakers relaying, current transformers, etc will need to be supplied as part of this estimate. All power and control cable to support the use of the 6.9kV Switchgear in the responsibility of this estimate. The 6.9kV switchgear is rated 500MVA and the additional breakers and vertical sections will need to meet these requirements.

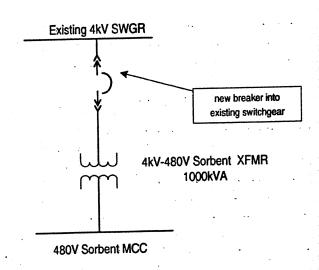
Low voltage loads will be evenly across both 480V SWGR and MCC buses.

#### **Equipment Location Notes:**

- Existing 6.9kV Switchgear are located in the station in the between the boiler area and the turbine area.
- New Wet ESP Switchgear and MCCs will need to be located in new Electrical Equipment Building.

		DRAWING RELE			SCALE NONE			
REV DATE	PREPARED REVIEWE	APPROVED	PURPOSE RELEASED FOR PRELIMINARY LAYOUT	27 - E-7 - Lef	PROJECT	PRELIMINARY LAYOUT	Sargeht & Lundy	10
0 12-09-05	BTC		RELEASED FORT TIZZINIII WITT Z 1100	1	NUMBER	MILL CREEK UNIT 3		
		2			10584-022		DWG CLASS:	REV
						WET ESP SYSTEM	SK-MC3-WE-22	10
							SHEET 1 OF 1	

#### TYPICAL FOR BOTH UNIT 3 AND UNIT 4



Description Description	HP	units	QTY
Convey Air Blower Motor	250	hp	2
Blower Enclosure Fan Motor	10	hp	2
Hydraulic Duty Pump Motor	25	hp	1
Hydraulic Standby Motor	25	hp	1
Hydraulic Recirculation Pump Motor	10	hp	1
Dust Collector Fan Motor	10	hp	2
Dust Collector Rotory Feeder Motor	10	hp	1
Hydraulic Cooling Fan Motor	10	hp	1
Silo Screw Feeder Motor	25	hp	. 1
Weigh Bin Rotory Feeder Motor	10	hp	2
Airlock Rotory Feeder Motor	10	hp	2
Glycol Duty Pump Motor	25	hp	. 1
Glycol Standby Pump Motor	25	hp	1
Chiller Motor	10	hp	7
Desicant Wheel Reg Fan Motor	1	hp	2
Desicant Wheel Drive Motor	2	hp	2
Desicant Wheel React Heater	24	kw	2
Main Elevator Motor	50	hp	1
Transformer 480:208V Lighting/HVAC 3 phase	28	kva	1
Transformer 480:120/240V Control 1 phase	50	kva	1
HVAC Exhaust Fan Motor	7.5	hp	2
HVAC Supply Fan Motor	7.5	hp	2
HVAC Blower Heater	5	kw	4
HVAC Blower Heater	10	kw	4

	•	•		DRAWING RELE	ASE RECORD
REV	DATE	PREPARED	REVIEWED	APPROVED	PURPOSE
0	12-09-05	BTC			RELEASED FOR PRELIMINARY LAYOUT
Ť		a			
		1	1		T

	SCALE	
	NONE	PRELIMINARY LAYOUT
	PROJECT NUMBER	MILL CREEK UNIT 3
	10584-022	WILL OFFICER OWN
		SORBENT INJECTION SYSTEM

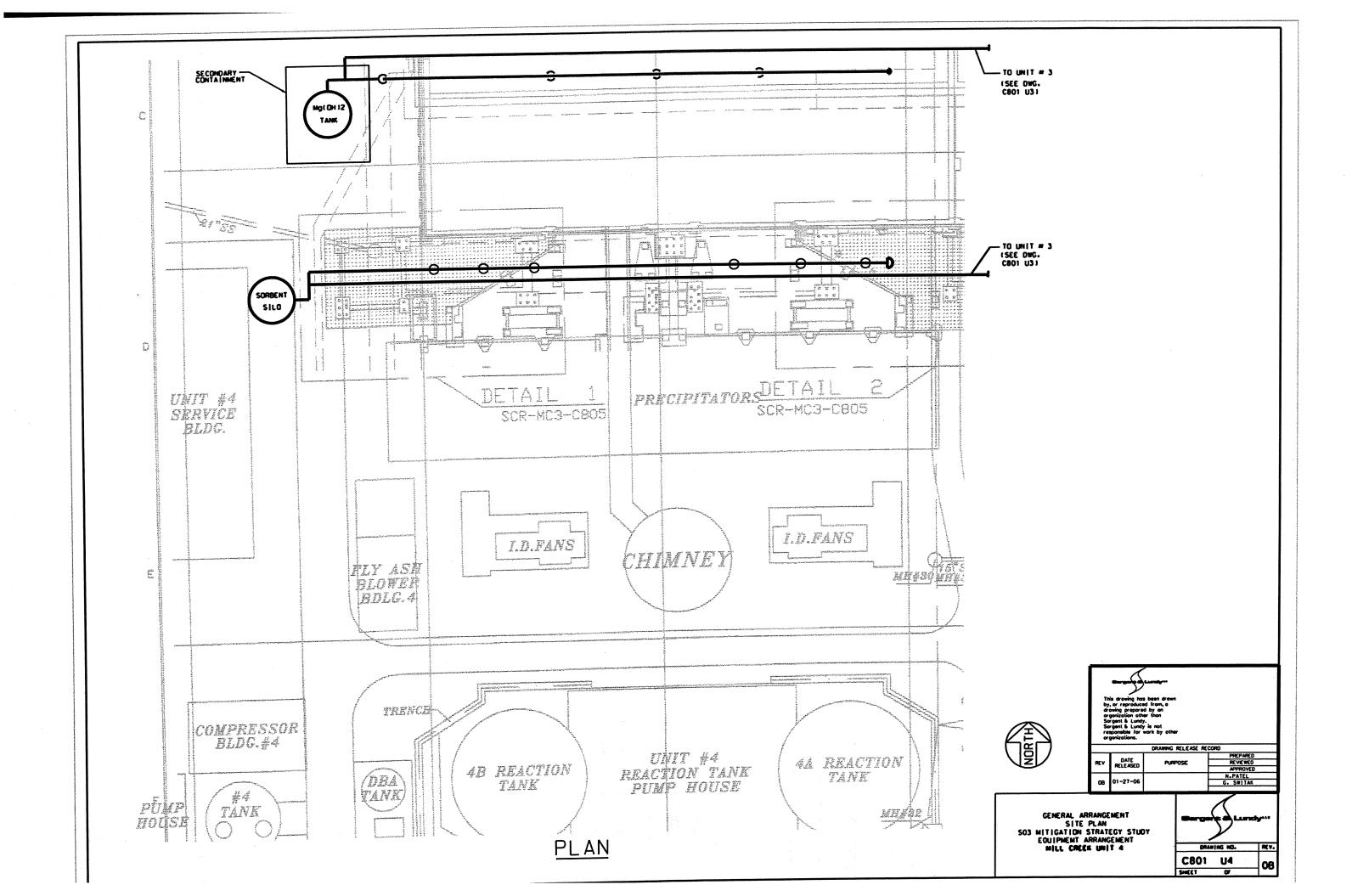
Sargent & Lundy Lundy DWG CLASS: REV.

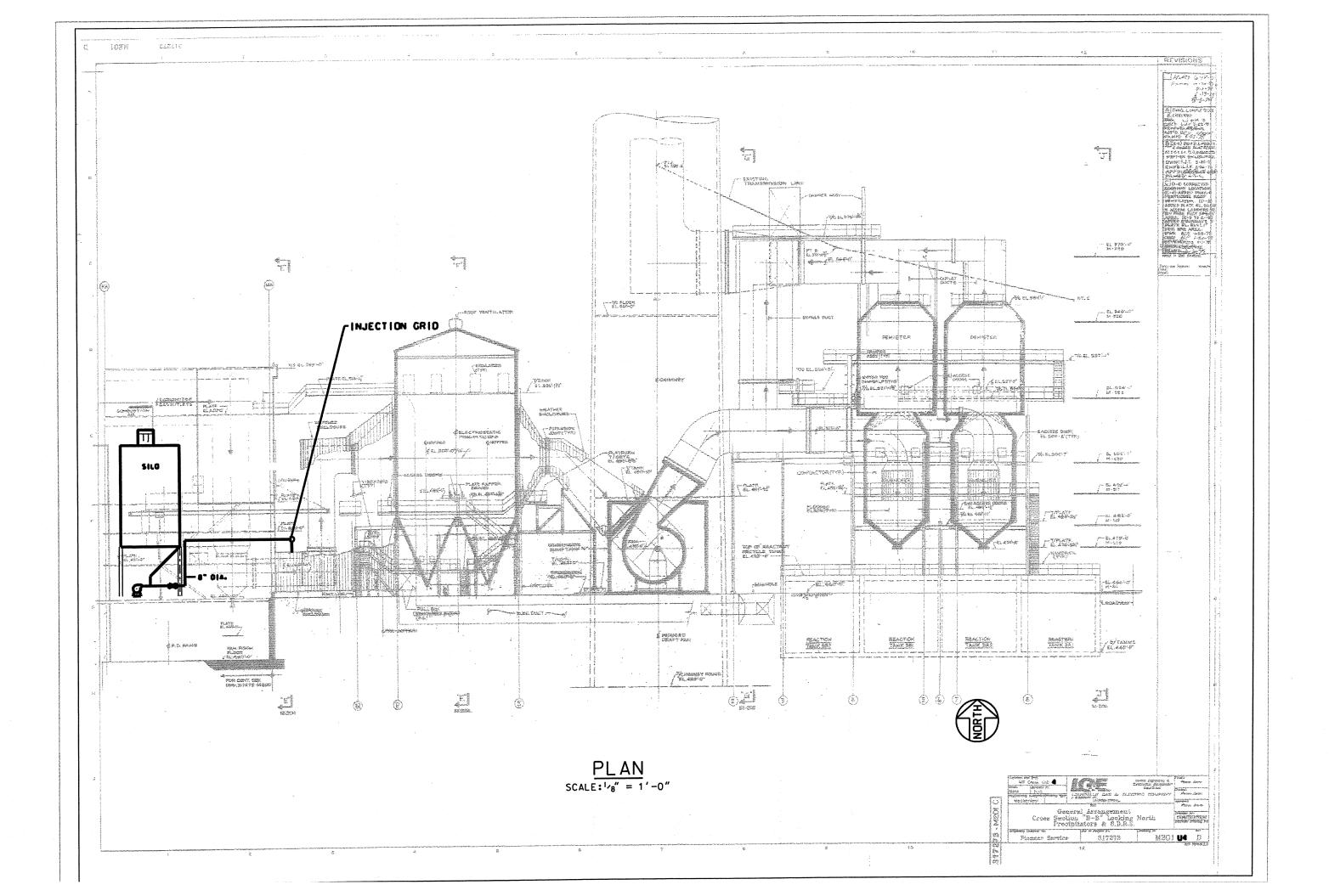
SK-MC3-SI-22

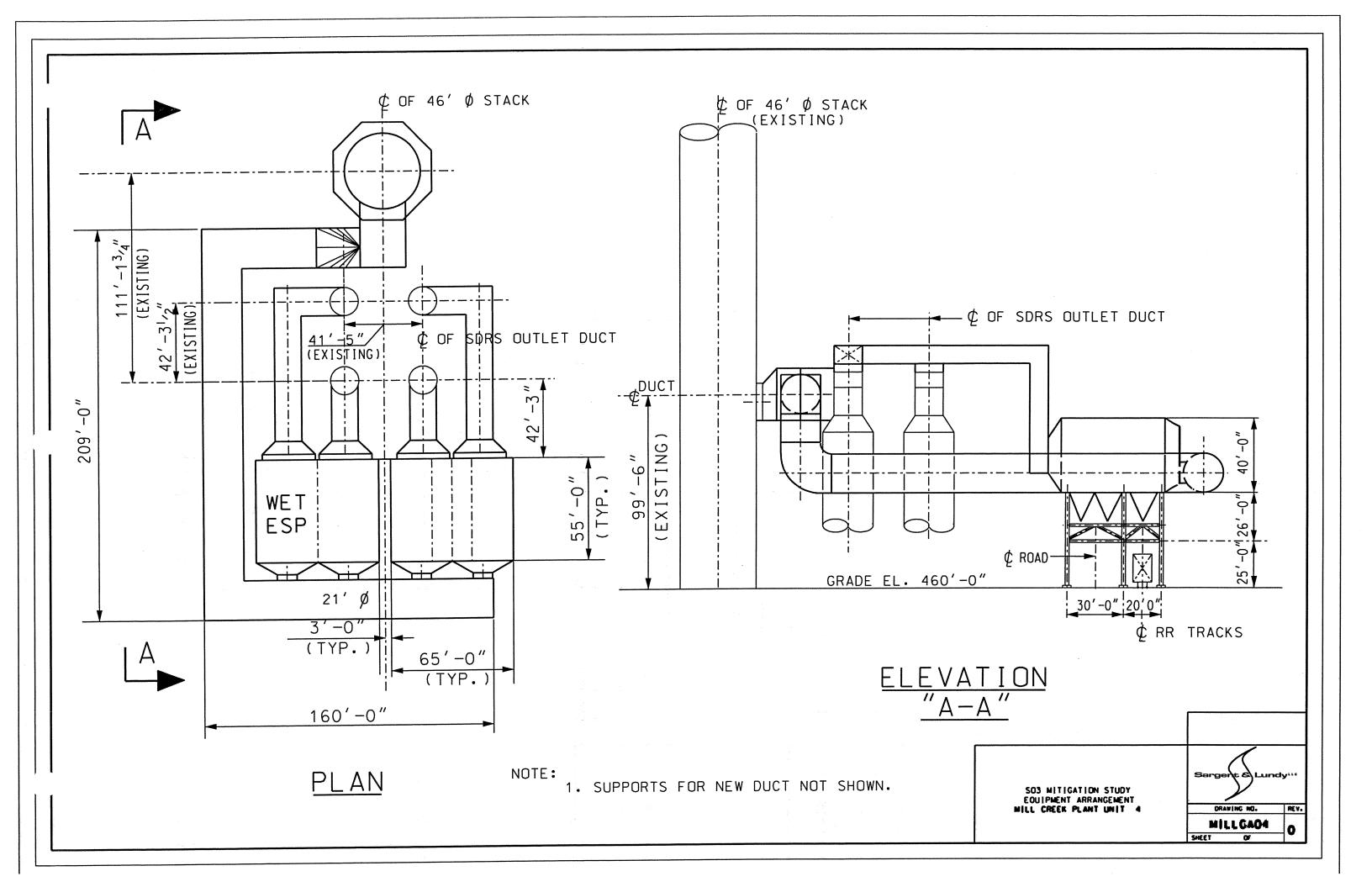
SHEET 1 OF 1

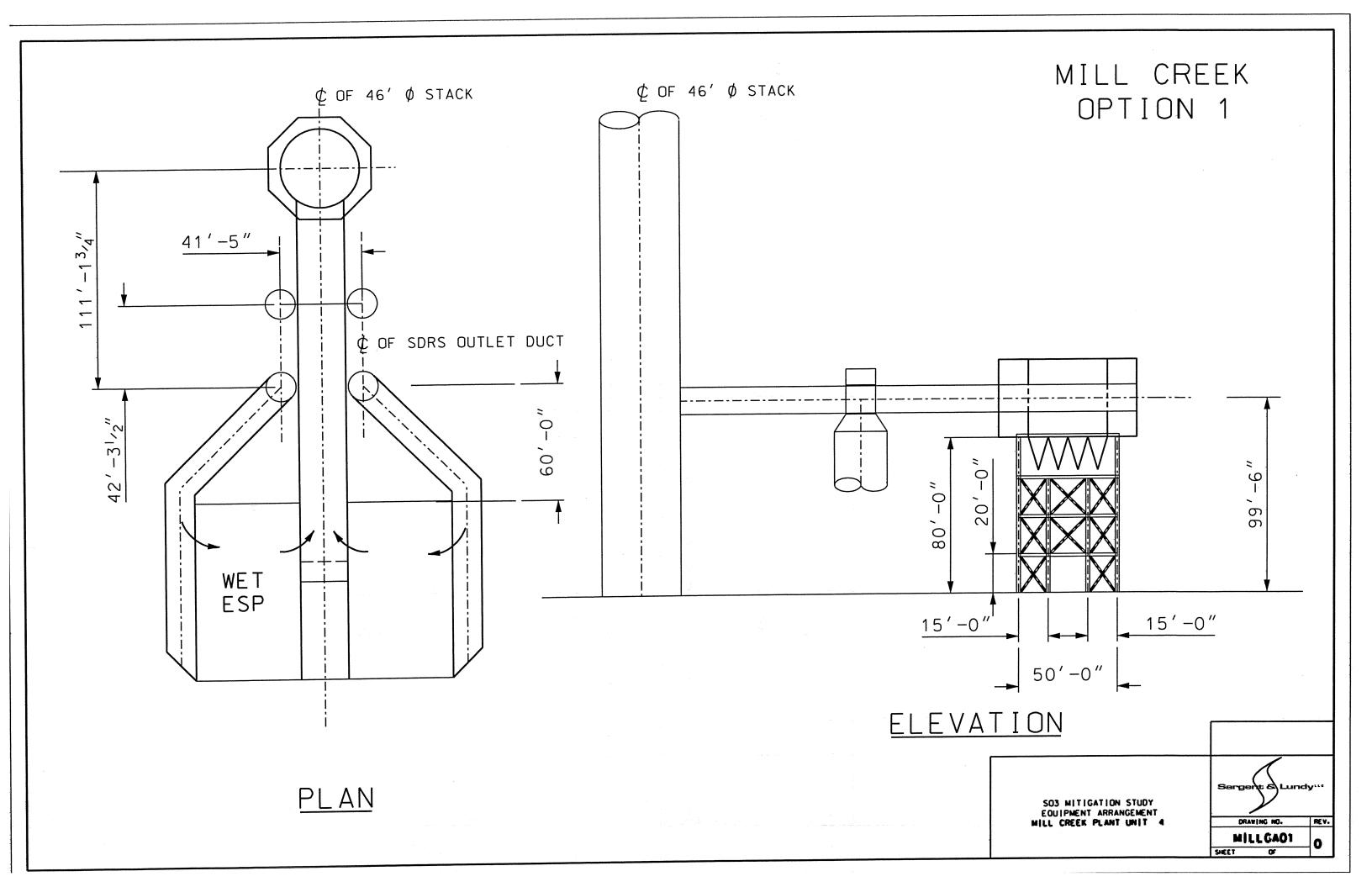


Mill Creek 4

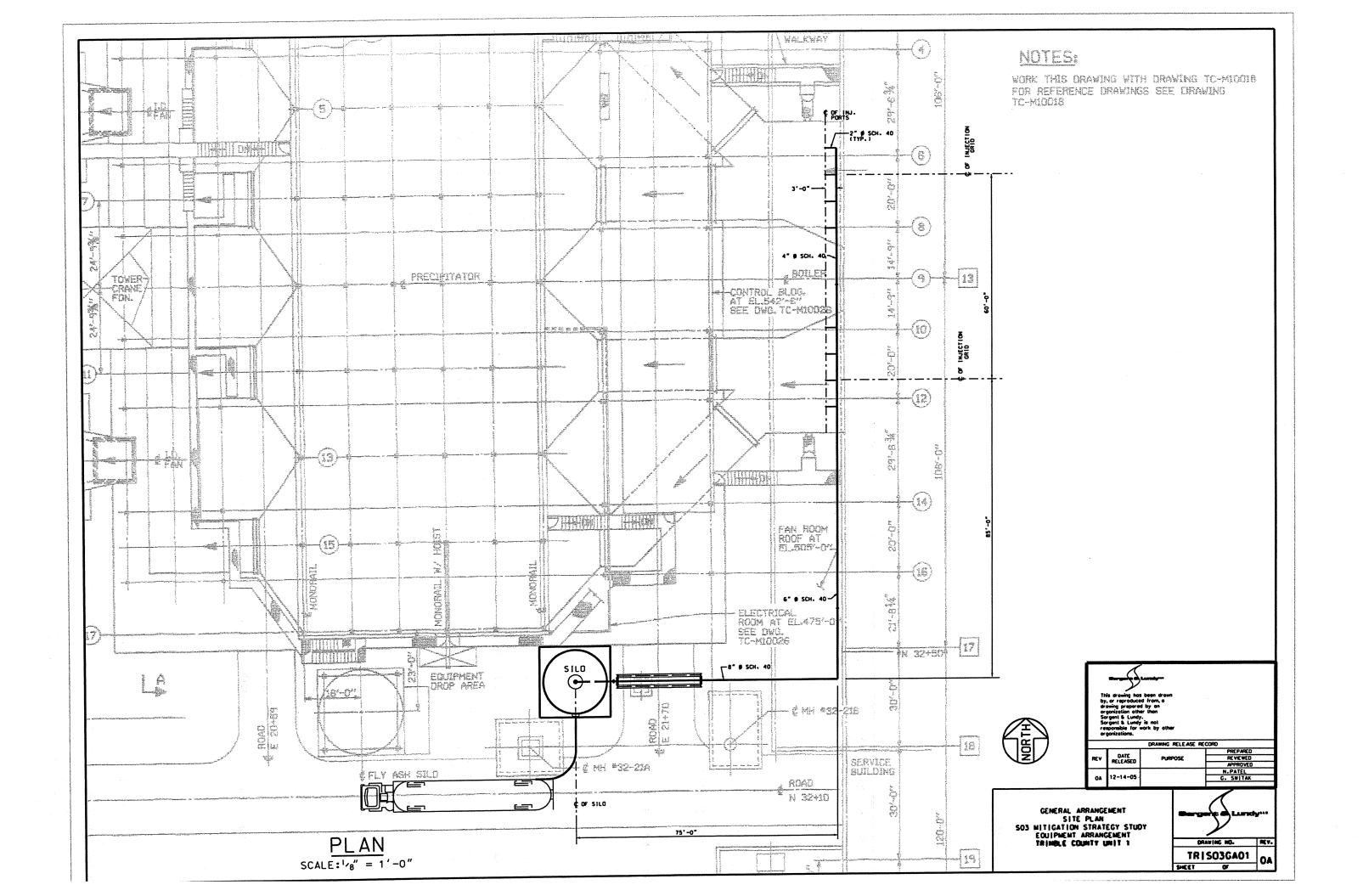


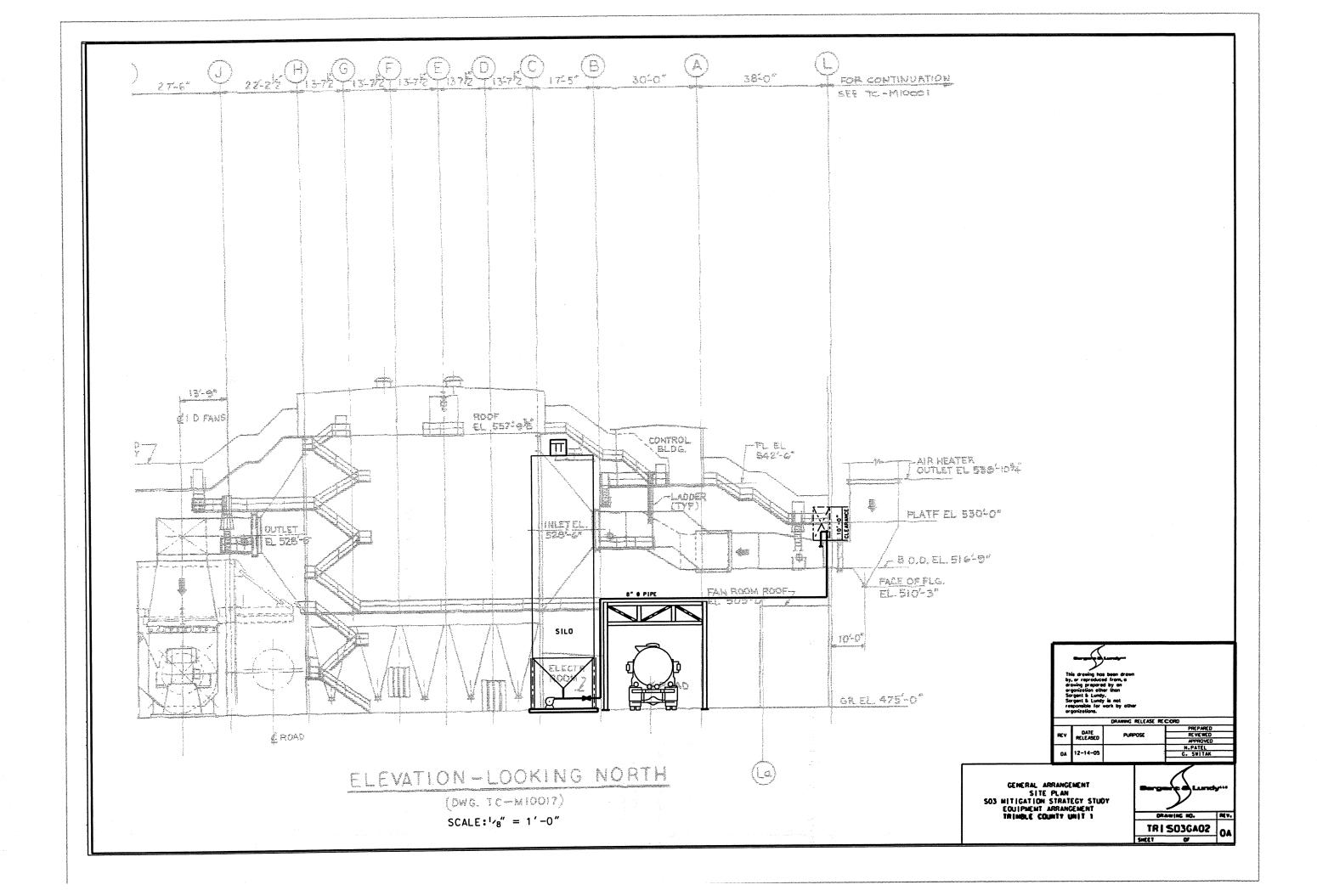




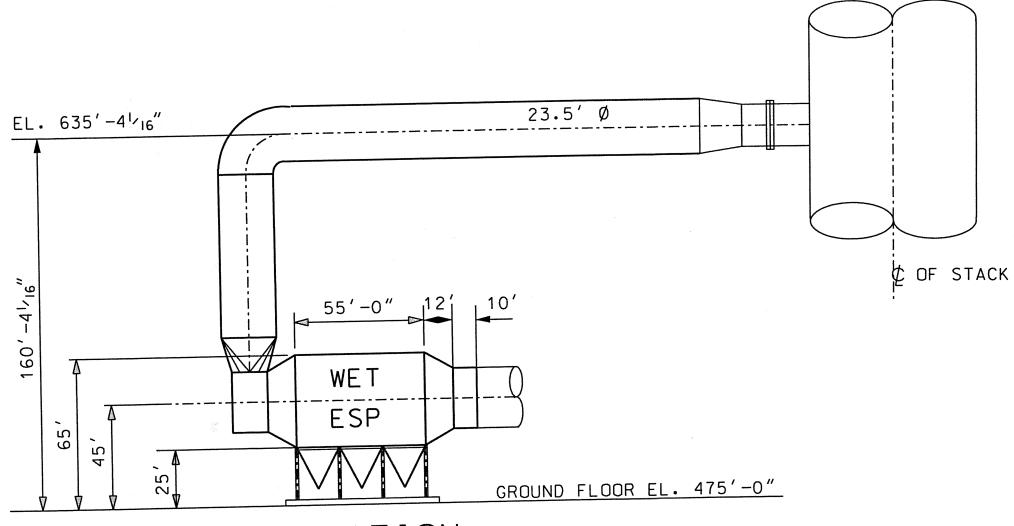


Trimble County 1





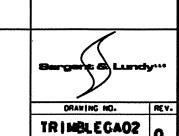
#### TRIMBLE COUNTY UNIT 1

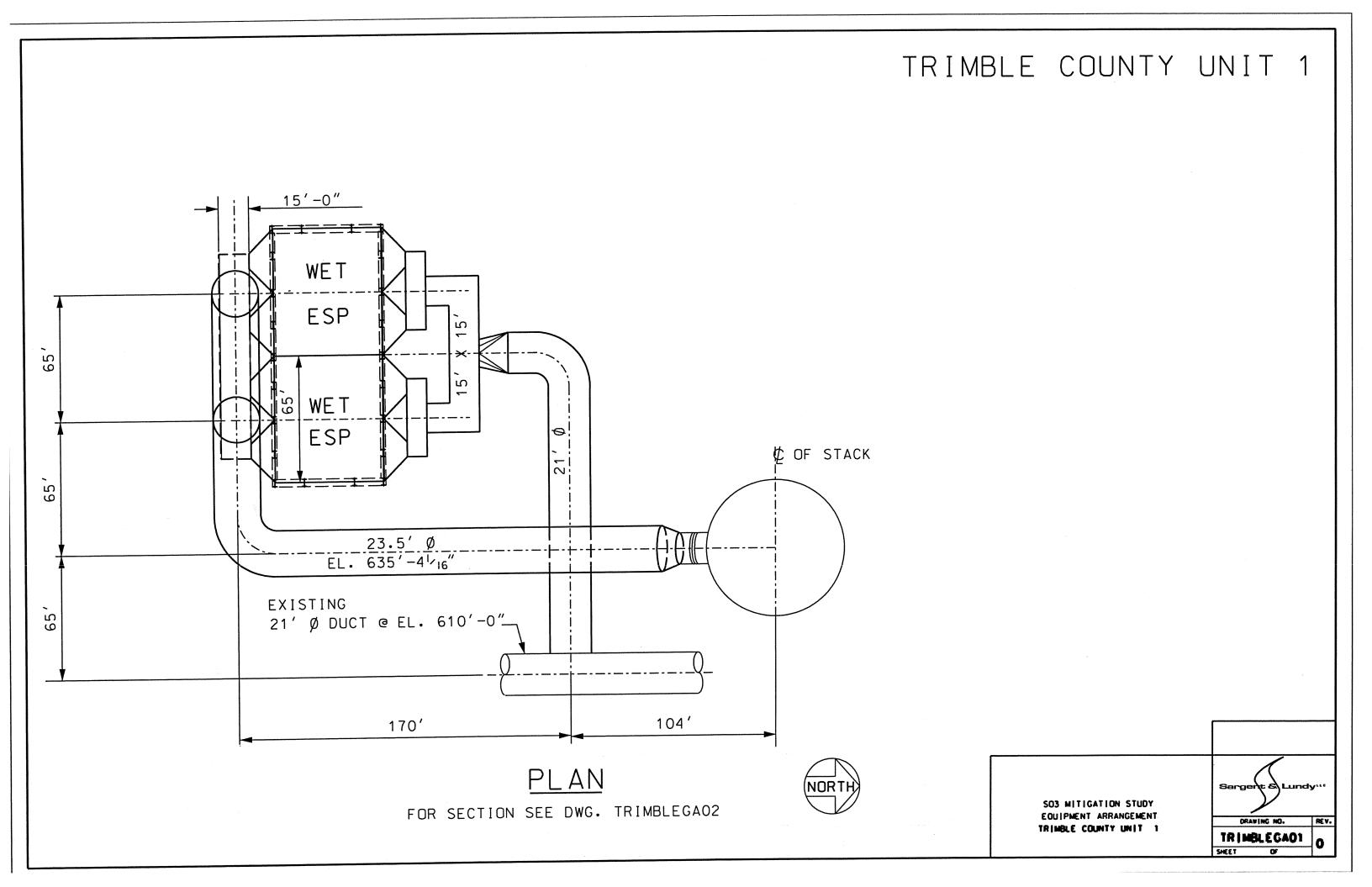


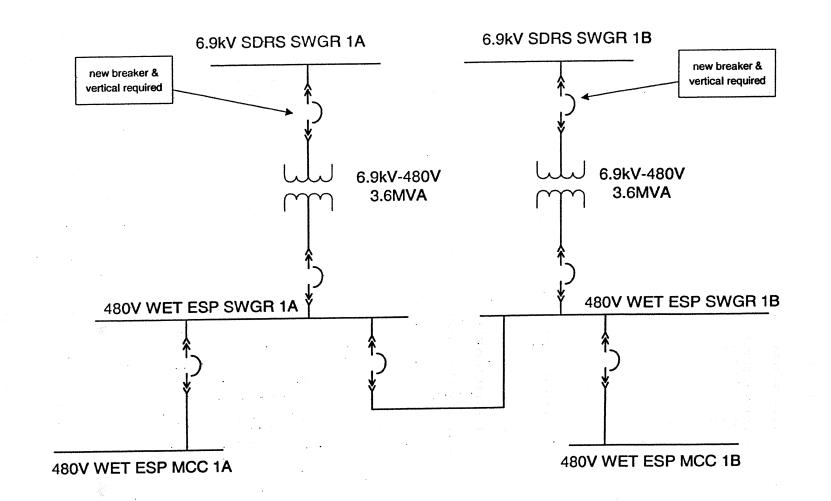
ELEVATION LOOKING WEST

FOR PLAN SEE DWG. TRIMBLEGA01

SO3 MITIGATION STUDY EQUIPMENT ARRANGEMENT TRIMBLE COUNTY UNIT 1





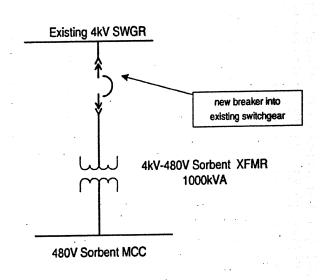


Equipment	QTY	HP	Power Source
First Field Recirc Water Pumps	3.		480 MCC
Second Field Recirc Water Pumps	3		480 MCC
Third Field Recirc Water Pumps	3	L	480 MCC
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Low voltage loads will be evenly across both 480V SWGR and MCC buses.

			-	DRAWING RELEA	ASE RECORD	SCALE			
REV	DATE	PREPARED	REVIEWED	APPROVED	PURPOSE	NONE	PRELIMINARY LAYOUT	Sargent & Lundy	uc
0	12-09-05	втс			RELEASED FOR PRELIMINARY LAYOUT	PROJECT NUMBER			
	a. Jan 1					10584-022	TRIMBLE COUNTY UNIT 1		
		- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1				10304-022		DWG CLASS:	F
							WET ESP SYSTEM	1 014 - 00	1
								SK-TC-WE-22	11
			Anna ann an an an an an	**				SHEET 1 OF 1	7



	<del></del>		
Description	HP	units	QTY
Convey Air Blower Motor	250	hp	2
Blower Enclosure Fan Motor	10	hp	2
Hydraulic Duty Pump Motor	25	hp	1
Hydraulic Standby Motor	25	hp	1
Hydraulic Recirculation Pump Motor	10	hp	1
Dust Collector Fan Motor	10	hp	2
Dust Collector Rotory Feeder Motor	10	hp	1
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HVAC Supply Fan Motor	7.5	hp	2
HVAC Blower Heater	5 .	kw	4
HVAC Blower Heater	10	kw	4

F		DRAWING RELEASE RECORD						SCALE			
ŀ.	REV	DATE	PREPARED	REVIEWED	APPROVED	PURPOSE		NONE	PRELIMINARY LAYOUT	Sargent & Lundy	
·E		12-09-05	BTC	1120120		RELEASED FOR PRELIMINARY LAYOUT		PROJECT NUMBER	TRIMBLE COUNTY UNIT 1		
-	$\dashv$							10584-022	77	DWG CLASS:	REV.
E									SORBENT INJECTION SYSTEM	SK-TC-SI-22	0
										SHEET 1 OF 1	U