JOB NO. 8031

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION

REPORT ON AMBIENT NOISE SURVEY

By S. C. Lou
September 24, 1973

INTRODUCTION

As part of the environmental consideration for the design and construction of the Limerick Generating Station, a sound survey of the area surrounding the plant site was conducted by F. H. Brittain and S. C. Lou, both noise specialists of Bechtel. In order to obtain a variety of ambient conditions with minimum interference from construction, the measurements were made on Tuesday, June 12, 1973, when schools in the area were still in session; in the early morning of Wednesday, June 13, between the hours of 2 and 4 a.m.; on Wednesday, June 13, the first day the schools were out; and on Saturday morning, June 16, representing a weekend, when all construction at the plant ceased. During the week days, construction was limited to some earth moving equipment working at a slack pace.

SITE DESCRIPTION

The site of the generating plant is located about 2 miles southeast of Pottstown, Penn., on the east bank of Schuylkill River as it flows toward Norristown and Philadelphia into the Delaware River. To the north is the town of Sanatoga and to the south are Linfield and Parker Ford, all within 1 to 2 miles. U.S. Highway 422 runs east-west about 1 mile north of the site, and at about the same distance to the southwest is State Highway 724.

Concentrated residences are located in Pottstown and Linfield, each about 2 miles from the plant. More scattered residences are found along Ridge Pike, which extends east from Pottstown's main business street, High Street; along Schuylkill Road, a main road parallel to Highway 724 on the west side of Schuylkill River, and along some smaller roads around the plant site.

General terrain of the area consists of rolling hills with open fields interspersed with densely wooded sections. The immediate vicinity of the LGS site is especially largely forested.

Besides the many industrial and commercial operations in Pottstown, there is a big Continental Distillery to the south of LGS, a large Firestone Plant to the northwest, and some light industrial operations on the west bank of the river. Reading Railroad tracks run on the east bank and alongside the west fenceline of the plant, while Penn Central tracks run on the opposite bank.

A topographical map, Drawing No. LGS-101, shows the general features of the area and the relative locations of the different parts described. On this map are also shown the numbered points where noise measurements were made. These points were chosen to give a reasonable spread of measuring locations. They also

represented various existing environments such as residential, commercial, industrial, traffic, etc. The site of the Limerick Generating Station is shown by the edge-hatched area in the center. Description of the measuring points is shown on Sheet No. LGS-102.

SURVEY PROCEDURE

A quick traverse of the area surrounding the plant site was made on the morning of June 12 during which the surveyors familiarized themselves with the location and selected the points of measurement. The first round of noise level readings were taken in the afternoon of June 12, but the midnight survey was delayed 2 or 3 hours by a heavy thunder storm. Daytime readings were again taken on Wednesday, June 13, to note any difference due to schools being in or out of session. Finally, the same survey was repeated on Saturday, June 16, to include a weekend noise condition. Description of the days of measurement is shown on Sheet No. LGS-103.

Measuring instruments used were: B&K Type 2209 Impulse Precision Sound Level Meter with 1" microphone, B&K Type 1613 Filter Set, and B&K Type 4220 Pistonphone for calibration. A tripod and a windscreen were used with the meter throughout the measurements. The sound level meter was calibrated with the pistonphone before and after each complete survey, and it was checked for battery and internal calibration before and after measurement at each point. The instrument was found to be in calibration at all times, and no adjustment was necessary to any of the readings taken.

NOISE SOURCES

Except where specifically noted, only the level of the general noise prevailing at each location was measured. Bursts of noise due to automobiles driving by, jet planes flying over, or dogs barking in the neighborhood were not considered as prevailing ambient noise and were not recorded. Sources constituting the ambient or background noise included wind, rustling leaves, birds, insects, traffic, distant industrial plants, and dripping and flowing water, especially after the Tuesday night thunder strom. These sources were listed, where relevant, on the data sheets for the different measuring points.

RESULTS

The measured noise levels are tabulated on data sheets LGS-104 through LGS-112, which show measuring points and day of survey, as described in LGS-102 and 103, the time the measurements were made, and both the A-weighted and the octave band sound levels. Other pertinent information is shown at the top of the data sheets.

The dBA levels at different locations and different times are summarized in the table on Sheet LGS-113.

SOME OBSERVATIONS

Except on three occasions, the ambient noise level at all locations around the Limerick Generating Station was between 39 and 50 dBA. The three exceptions were: Point 3 outside the subcontractor gate where the operation of some earth moving tractors raised the ambient noise level to 60 dBA; Point 2 on the east end of a trussed bridge on Schuylkill River, where a passing train produced a noise level of 67 dBA - after the train passed, the level dropped to 50 dBA - and Point 11 at the Firestone Plant where the noise from the plant measured 54 dBA.

From LGS-113, it is seen that at points 1, 3 and 5 the noise level dropped appreciably between Tuesday afternoon and predawn Wednesday or Saturday morning. If the noise at these points was attributable to the Firestone Plant, the construction inside the LGS site, and Continental Distillery respectively, then the drop might be due to reduced activity at night and on weekends. Point 2, which was located between LGS and the Firestone Plant, would have shown the same pattern except for the predawn noise level which, instead of going down, actually increased. This was believed to be due to increased water flow in the adjacent river after the heavy rain fall.

If variations of 1 or 2 dB are to be considered insignificant, then the only other observation from the summary table on LGS-113 is that the daytime level was higher on Wednesday than on Tuesday (Points 7, 8 and 9). School being out could be one of the reasons for this phenomenon. However, the readings on Saturday morning at these points seemed to contradict this explanation.

Description of Measuring Points. See Area Map

Point 1 In front of 1435-1443 Sunset Drive.
Quiet residential area.

Point 2 East of trussed bridge on Schuylkill River.
Both bridge and road blocked on days of survey. Railroad tracks next to the road and quarry about 1000 ft. to the east.

Point 3 On Possum Hollow Road outside of Subcontractor gate.
One residence next to fence owned by P.E. Another residence about 250 ft. further away.

Light construction going on (Bulldozer moving earth).

Point 4 Corner of Sanatoga and Limerick Center Roads.
Relatively busy intersection. Open fields with only a few houses in the immediate vicinity.

Point 5 Church and Reformed Roads in Linfield.
Parking lot at back of a church. Commerical area.

Point 6 On 5 ft. embankment on Long View Road close to railroad tracks.
Paved road ending about 100 ft. to the north. Open fields around.

Point 7 In Oak Grove Cemetary on Old Schuylkill Road near Saylors Mill Road.
Schuylkill Road is a main thoroughfare and highway 724 is less than 1000 ft. away.

Point 8 In another cemetary on Old Schuylkill Road near Ellis Woods Road.
Highway 724 is less than 1000 ft. to the northeast and U.S. 422 traverses about 3000 ft. to the north.

Point 9 In a tall grass field off Fricks Lock Road. Residences across and up and down the road. Big Eastern Warehouse about 200 ft. away.

Point 10 Backyard of P.E. owned residence at northeast corner of Limerick Station just outside the property fence. During construction, a batching plant and various tankage fabricating operations will be located in the area inside the fence.

Point 11 In the parking lot of Firestone Plant.

Description of Days of Measurement.

A Tuesday, June 12, 1973.

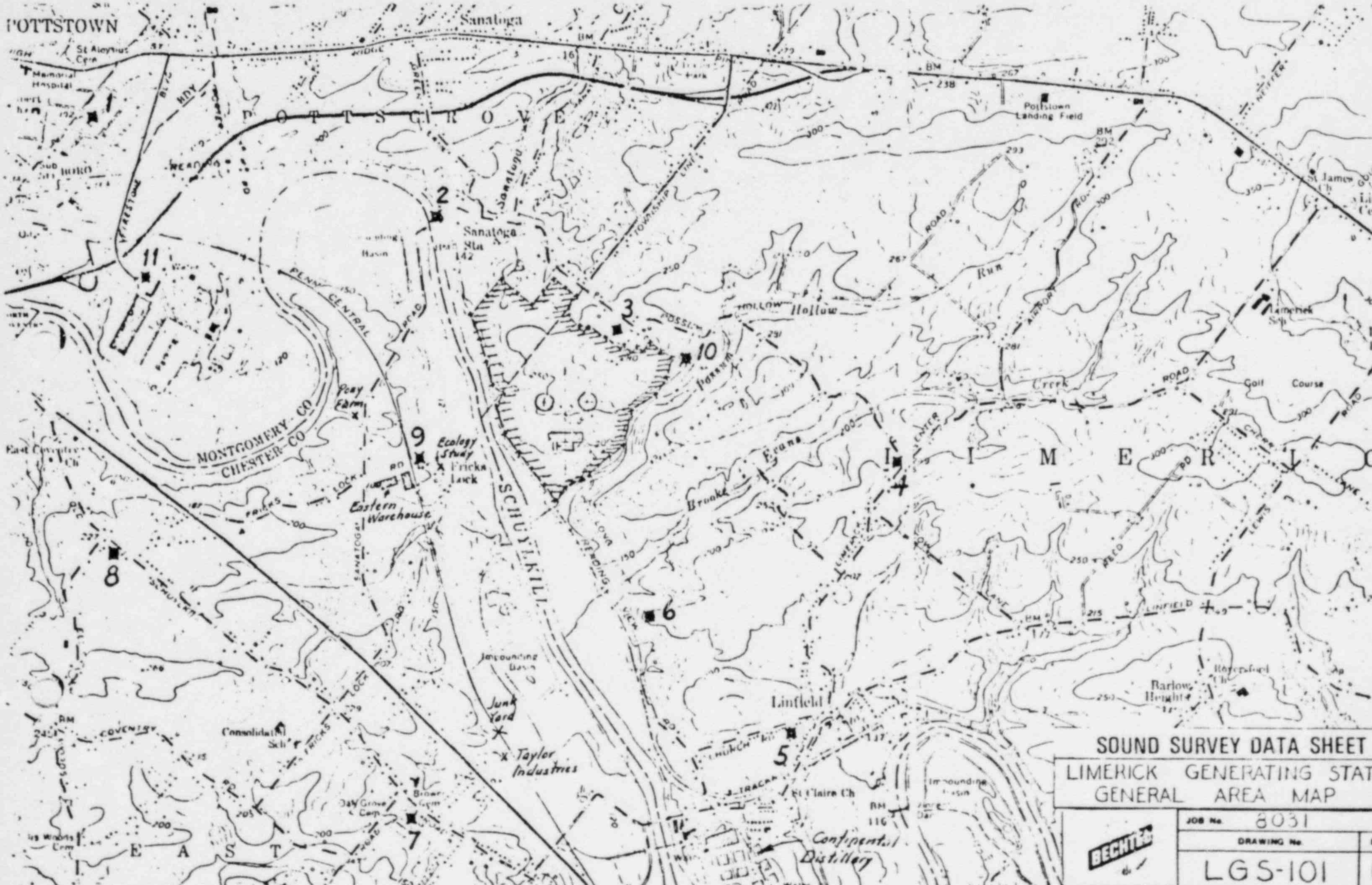
Fair and hot with temperature in the 90's, slight breeze and high humidity. Heavy thunderstorm from 9 p.m. to 1:30 a.m. Wednesday.

B Wednesday, June 13, 1973.

Before dawn, cool after the rain, around 60°F. No wind. Fair and warm during the day with occasional showers, 70° - 80°F temperature with little wind.

C Saturday, June 16, 1973, morning.

Overcast and cool, 60° - 70°F, with little wind.


POTTSTOWN
Sanatoga
POTTSGROVE
Pottstown Landing Field
Sanatoga Sta
MONTGOMERY CO
CHESTER CO
PENN CENTRAL
Pony Farm
Ecology Study
Fricks Lock
Eastern Warehouse
SCHUYLKILL
Junk Yard
Taylor Industries
Impounding Basin
Hollow
Run
Creek
Brooke Evans
Golf Course
Limerick Sch
LIMERICK
Linfield
Barlow Heights
Royersford
St Clair Ch
Continental Distillery
Consolidated Sch
EAST
1
2
3
4
5
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8
9
10
11
SOUND SURVEY DATA SHEET
LIMERICK GENERATING STATI
GENERAL AREA MAP
BECHTEL
JOB No. 8031
DRAWING No.
LGS-101

NOISE SOURCES: Dist) traffic, birds, insects. (

OPERATING CONDITIONS

ENVIRONMENT Residential

WEATHER See LGS-103 TEMP. WIND REL. HUM.

INSTRUMENT USED	OCT-BAND ANAL.	MIKE-PREAMP	CALIBRATOR	
MAKE AND TYPE	B&K Types 2209/1613		B&K Type 4220	

POINT NO.	DISTANCE FROM SOURCE	HEIGHT FROM BASE	DESCRIPTION OF MICROPHONE LOCATION	TIME OF DAY	SOUND LEVEL		SOUND PRESSURE LEVEL dB RE 0.0002 MICROBAR								
					WEIGHTED		OCTAVE BAND CENTER FREQUENCY, Hz								
					FLAT	A	31.5	63	125	250	500	1K	2K	4K	8K
1A		4'	See Note below	2:45 p.m.		50	58	61	56	53	47	42	37	31	29
1A		4'		2:45 p.m.		48	61	61	58	52	45	42	38	34	26
1B		4'		2:05 a.m.		39	54	55	50	43	37	31	26	18	9
1C		4'		7:00 a.m.		43	55	55	52	43	37	34	32	31	20

Note: This set of data was obtained with a General Radio Type 1558A Octave Band Analyzer concurrently with the measurements taken with the B&K instrument at the same location.

No	DATE	REVISIONS	BY	CHK'D	DESIGN SUPV	ENG'R	PROJ ENGR	APPR
0	6/24/73	MEASUREMENTS TAKEN 6/12,13,16/73	FHB, SCL					

SCALE | DESIGNED | DRAWN | CHIEF ENGR

ORIGIN

BECHTEL

SOUND SURVEY DATA SHEET

JOB No. 8031

DRAWING No. LGS-104

REV. 0

NOISE SOURCE Traffic, Aircraft, Quarry Equipment

OPERATING CONDITIONS

ENVIRONMENT River, RR Tracks, Quarry

WEATHER See LGS-103 TEMP. WIND REL. HUM.

INSTRUMENT USED	OCT-BAND ANAL.	MIKE-PREAMP	CALIBRATOR	
MAKE AND TYPE	B&K 2201/1613		B&K 4220	

POINT NO.	DISTANCE FROM SOURCE	HEIGHT FROM BASE	DESCRIPTION OF MICROPHONE LOCATION	TIME OF DAY	SOUND LEVEL	SOUND PRESSURE LEVEL dB RE 0.0002 MICROBAR								
					WEIGHTED	OCTAVE BAND CENTER FREQUENCY, Hz								
					FLAT	A	31.5	63	125	250	500	1K	2K	4K	8K
2A		7'		3:10 p.m.		48	60	58	57	51	44	40	38	33	24
2B		7'	See Note Below	2:30 a.m.		67	78	77	72	70	66	61	60	55	46
2B		7'		2:30 a.m.		50	58	55	55	51	46	44	42	34	23
2C		7'		7:15 a.m.		43	55	54	53	46	37	31	30	30	19

Note: Train passing at about 60 ft from and 20 ft. above microphone location. Train speed estimated at 20-25 mph.

No.	DATE	REVISIONS	BY	CHK'D
C	9/24/73	MEASUREMENTS TAKEN 6/12,13,16/73	FHA	SCL

DESIGN SUPV | ENG'R | PROJ ENGR | APPR

SCALE | DESIGNED | DRAWN | CHIEF ENGR

ORIGIN

BECHTEL

SOUND SURVEY DATA SHEET

JOB No. 8031

DRAWING No. LGS-105 REV. 0

R&C SFE FORM 294 (10/71)

NOISE SOURCE Wind, Aircraft, Caterpillar Tractor, Crickets

OPERATING CONDITIONS

ENVIRONMENT Residential w/ Construction nearby

WEATHER See LGS-103 TEMP. WIND REL. HUM.

INSTRUMENT USED	OCT-BAND ANAL.	MIKE-PREAMP	CALIBRATOR	
MAKE AND TYPE	B&K 2209/1613		B&K 4220	

POINT NO.	DISTANCE FROM SOURCE	HEIGHT, FROM BASE	DESCRIPTION OF MICROPHONE LOCATION	TIME OF DAY	SOUND LEVEL		SOUND PRESSURE LEVEL dB RE 0.0002 MICROBAR								
					WEIGHTED		OCTAVE BAND CENTER FREQUENCY, Hz								
					FLAT	A	31.5	63	125	250	500	1K	2K	4K	8K
3A				3:30 p.m.		60	61	67	66	57	53	54	52	51	35
3B				2:45 a.m.		44	62	55	53	42	33	24	21	38	20
3C				7:25 a.m.		42	55	55	54	44	38	32	25	28	12

No.	DATE	REVISIONS	BY	CHK'D	DESIGN SUPV	ENG'R	PROJ ENG'R	APPR
C	4/24/73	MEASUREMENTS TAKEN 2/12-13, 16/73	EHB, SCL					

SCALE | DESIGNED | DRAWN | CHIEF ENG'R

ORIGIN

BECHTEL

SOUND SURVEY DATA SHEET

JOB No. 6021

DRAWING No. LGS-106 REV. 0

NOISE SOURCE (Wind, Leaves, Birds, Aircraft)

OPERATING CONDITIONS

ENVIRONMENT Grass-Road

WEATHER See LGS-103 TEMP. _____ WIND _____ REL. HUM. _____

INSTRUMENT USED	OCT-BAND ANAL.	MIKE-PREAMP	CALIBRATOR	
MAKE AND TYPE	B&K 2209/1613		B&K 4220	

POINT NO.	DISTANCE FROM SOURCE	HEIGHT FROM BASE	DESCRIPTION OF MICROPHONE LOCATION	TIME OF DAY	SOUND LEVEL		SOUND PRESSURE LEVEL dB RE 0.0002 MICROBAR								
					WEIGHTED		OCTAVE BAND CENTER FREQUENCY, Hz								
					FLAT	A	31.5	63	125	250	500	1K	2K	4K	8K
4A				4:16 p.m.		43	47	50	49	36	33	32	32	35	27
4B				3:05 a.m		43	56	58	57	43	31	28	22	21	11
4C				7:35 a.m.		42	50	54	56	36	31	26	28	34	18

No.	DATE	REVISIONS	BY	CHK'D	DESIGN SUPV	ENG R	PROJ ENGR	APPR
C	9/24/73	MEASUREMENTS TAKEN 6/12.13,16/73	FHE, SCL					

SCALE | DESIGNED | DRAWN | CHIEF ENGR

ORIGIN

BECHTEL

SOUND SURVEY DATA SHEET

JOB No. 8031

DRAWING No. LGS-107

REV. 0

NOISE SOURCE Traffic, Birds, Dogs, People Talking, Leaves, Industry

OPERATING CONDITIONS

ENVIRONMENT Church Parking Lot

WEATHER See LGS-103 TEMP. WIND REL. HUM.

INSTRUMENT USED	OCT-BAND ANAL.	MIKE-PREAMP	CALIBRATOR	
MAKE AND TYPE	B&K 2209/1613		B&K 4220	

POINT NO.	DISTANCE FROM SOURCE	HEIGHT FROM BASE	DESCRIPTION OF MICROPHONE LOCATION	TIME OF DAY	SOUND LEVEL		SOUND PRESSURE LEVEL dB RE 0.0002 MICROBAR								
					WEIGHTED		OCTAVE BAND CENTER FREQUENCY, Hz								
					FLAT	A	31.5	63	125	250	500	1K	2K	4K	8K
5A				4:35 p.m.		46	52	53	51	47	41	36	34	28	22
5B				3:23 a.m.		39	48	44	43	43	38	33	25	20	10
5C				7:48 a.m.		40	52	51	51	48	36	30	33	30	19

No	DATE	REVISIONS	BY	CHK'D	DESIGN SUPV	ENG'R	PROJ ENGR	APPR
1	9/23/73	MEASUREMENTS TAKEN 6/12, 13, 16/73	FHB SCL					

SCALE | DESIGNED | DRAWN | CHIEF ENGR

ORIGIN

BECHTEL

SOUND SURVEY DATA SHEET

JOB No. 8031

DRAWING No. LGS-108 REV 0

NOISE SOURCE Wind, Aircraft, Insects

OPERATING CONDITIONS

ENVIRONMENT Open Field, RR Tracks

WEATHER See LGS-103 TEMP. WIND REL. HUM.

INSTRUMENT USED	OCT-BAND ANA ..	MIKE-PREAMP	CALIBRATOR	
MAKE AND TYPE	B&K 2209/1613		B&K 4220	

POINT NO.	DISTANCE FROM SOURCE	HEIGHT FROM BASE	DESCRIPTION OF MICROPHONE LOCATION	TIME OF DAY	SOUND LEVEL		SOUND PRESSURE LEVEL dB RE 0.0002 MICROBAR								
					WEIGHTED		OCTAVE BAND CENTER FREQUENCY, Hz								
					FLAT	A	31.5	63	125	250	500	1K	2K	4K	8K
6A				4:55 p.m.		41	50	52	49	41	40	33	26	22	11
6B				3:35 a.m.		43	50	54	50	39	37	28	25	22	26
6C				8:45 a.m.		42	53	57	54	47	41	26	30	25	20

No	DATE	REVISIONS	BY	CHK'D	DESIGN SUPV	ENG'R	PROJ ENGR	APPR
C	9/23/73	MEASUREMENTS TAKEN 6/12.13.16/73	FHB.SCL					

SCALE DESIGNED DRAWN CHIEF ENGR

ORIGIN

BECHTEL

SOUND SURVEY DATA SHEET

JOB No. 8031

DRAWING No. LGS-109 REV 0

NOISE SOURCE Traffic, Birds, Leaves, Trucks Operation

OPERATING CONDITIONS

ENVIRONMENT Cemetries, Close to Highway

WEATHER See LGS-103 TEMP. WIND REL. HUM.

INSTRUMENT USED	OCT-BAND ANAL.	MIKE-PREAMP	CALIBRATOR	
MAKE AND TYPE	B&K 2209/1613		B&K 4220	

POINT NO.	DISTANCE FROM SOURCE	HEIGHT FROM BASE	DESCRIPTION OF MICROPHONE LOCATION	TIME OF DAY	SOUND LEVEL		SOUND PRESSURE LEVEL dB RE 0.0002 MICROBAR								
					WEIGHTED		OCTAVE BAND CENTER FREQUENCY, Hz								
					FLAT	A	31.5	63	125	250	500	1K	2K	4K	8K
7A				5:55 p.m.		44	56	55	44	40	38	34	33	27	20
7B				1:08 p.m.		48	58	55	57	49	41	38	35	32	24
7C				8:36 a.m.		43	54	57	50	39	37	37	36	31	13
8A				5:25 p.m.		46	55	55	53	43	39	39	37	34	23
8B				12:35 p.m.		49	56	56	56	53	45	42	41	35	30
8C				8:15 a.m.		44	57	59	55	44	37	38	35	37	22

R&C SFE FORM 294 (10/71)

No	DATE	REVISIONS	BY	CHK'D	DESIGN SUPV	ENG'R	PROJ ENGR	APPR
C	9/24/73	MEASUREMENTS TAKEN 6/12,13,16/73	FHB, SCL					

SCALE | DESIGNED | DRAWN | CHIEF ENGR

ORIGIN

BECHTEL

SOUND SURVEY DATA SHEET

JOB No. 8031

DRAWING No. LGS-110

REV. 0

NOISE SOURCE Dog Barks, Fruit Bucket Loads

OPERATING CONDITIONS

ENVIRONMENT Residential w/ Sunday industries around

WEATHER See LGS-103 TEMP. WIND REL. HUM.

INSTRUMENT USED	OCT-BAND ANAL.	MIKE-PREAMP	CALIBRATOR	
MAKE AND TYPE	B&K 2209/1613		B&K 4220	

POINT NO.	DISTANCE FROM SOURCE	HEIGHT FROM BASE	DESCRIPTION OF MICROPHONE LOCATION	TIME OF DAY	SOUND LEVEL		SOUND PRESSURE LEVEL dB RE 0.0002 MICROBAR								
					WEIGHTED		OCTAVE BAND CENTER FREQUENCY, Hz								
					FLAT	A	31.5	63	125	250	500	1K	2K	4K	8K
9A				4:20 p.m.		40	53	52	51	44	37	31	33	29	16
9B				3:54 a.m.		39	53	57	50	43	35	32	26	17	9
9B				12:44 p.m.		44	55	57	53	43	39	34	33	29	18
9C				5:02 a.m.		43	51	50	48	40	36	26	35	35	15

No.	DATE	REVISIONS	BY	CHK'D	DESIGN SUPV	ENG'R	PROJ ENGR	APPR
0	9/20/73	MEASUREMENTS TAKEN 6/12,13,16/73	FHB, SCL					

SCALE | DESIGNED | DRAWN | CHIEF ENGR

ORIGIN

BECHTEL

SOUND SURVEY DATA SHEET

JOB No. 8031

DRAWING No. LGS-111

REV. 0

R&C SFE FORM 294 (10/71)

NOISE SOURCE See Below

OPERATING CONDITIONS

ENVIRONMENT

WEATHER See LGS-103 TEMP. WIND REL. HUM.

INSTRUMENT USED	OCT-BAND ANAL.	MIKE-PREAMP	CALIBRATOR	
MAKE AND TYPE	B&K 2204/1613		B&K 4220	

POINT NO.	DISTANCE FROM SOURCE	HEIGHT FROM BASE	DESCRIPTION OF MICROPHONE LOCATION	TIME OF DAY	SOUND LEVEL	SOUND PRESSURE LEVEL dB RE 0.0002 MICROBAR								
					WEIGHTED	OCTAVE BAND CENTER FREQUENCY, Hz								
					FLAT	A	31.5	63	125	250	500	1K	2K	4K	8K
10B				2:57 pm		44	55	55	53	43	43	41	39	39	29
10C				9:00 a.m		41	55	57	52	36	28	23	24	24	18
11B			Parking Lot of Firestone Plant	4:02 p.m		54	70	72	66	57	48	46	44	37	28

Noise sources in residential backyard were: Construction Equipment, Birds, Leaves. Noise in the Firestone parking lot was mainly from the plant.

No	DATE	REVISIONS	BY	CHK'D	DESIGN SUPV	ENG'R	PROJ ENGR	APPR
3	7/24/73	MEASUREMENTS TAKEN 6/12,13,16/73	FHB, SCL					

SCALE | DESIGNED | DRAWN | CHIEF ENGR

ORIGIN

BECHTEL

SOUND SURVEY DATA SHEET

JOB No. 8031

DRAWING No. LGS-112

REV. 0

Point of Measurement	A	B		C		D	
	Tuesday Afternoon 6/12/73	Wednesday Predawn 6/13/73	Change in Noise Level from Col. A	Wednesday Midday 6/13/73	Change in Noise Level from Col. A	Saturday Morning 6/16/73	Change in Noise Level from Col. A
1	49	39	(-10)	-	-	43	(-6)
2	48	50	(+2)	-	-	43	(-5)
3	60	44	(-16)	-	-	44	(-16)
4	43	43	(0)	-	-	42	(-1)
5	46	39	(-7)	-	-	40	(-6)
6	41	43	(+2)	-	-	42	(+1)
7	44	-	-	48	(+4)	43	(-1)
8	46	-	-	49	(+3)	44	(-2)
9	40	39	(-1)	44	(+4)	43	(+3)
10	-	-	-	44	-	41	-
11	-	54	-	-	-	-	-

No.	DATE	REVISIONS	BY	CH'K	APPR
0	9/24/73	Issued with Noise Report	FHB	SCL	

ORIGIN

COMMUNITY NOISE LEVELS
LIMERICK GENERATING STATION

JOB No. 8031
SPEC/DES. GUIDE No. LGS-113
REV. 0

FORM NO. A-1