

INFORME SOBRE ANALISIS DE MUESTRA EN CG

MUESTRAS: AGUA
CLIENTE: Misión Japonesa
FECHA: 30 de junio de 1994

TIPOS DE ANALISIS: Policloruros bifenilos (PCB's)

Para el análisis de las muestras, se utilizaron dos tipos de métodos: EPA METHOD 8080 Y ASTM METHOD D4861-88, éste último a través de una proceso de extracción en fase sólida con el sistema spe-21 Baker de octadecyl 18. Se elaboró una curva de calibración con diferentes concentraciones de los plaguicidas siguientes:

<u>POLICLORUROS BIFENILOS:</u>	<u>MINIMOS Y MAXIMOS DE LA CURVA</u>
2-CORO BIFENILO	20-80 ng/l
2,3-DICLOROBIFENIL	20-80 ng/l
2,4,5-TRICLOROBIFENIL	20-80 ng/l
2,2',4,6-TETRACLOROBIFENIL	40-160 ng/l
2,2',3,4,5'-PENTACLOROBIFENIL	40-160 ng/l
2,2',4,4',5,6'-HEXACLOROBIFENIL	40-160 ng/l
2,2',3,4',5,6,6'-HEPTACLOROBIFENIL	60-240 ng/l
2,2',3,3',4,5',6,6'-OCTACLOROBIFENIL	60-240 ng/l
DECACLOROBIFENIL	100-400 ng/l

Luego se procedió a la limpieza y concentración de la muestra para su posterior inyección en un Cromatógrafo de gases "Carlo Erba HRGC 5300, utilizando una columna capilar DB-5 y las condiciones siguientes:

Detector : ECD
 Tipo de inyección : On-Column
 Temperatura 1: 100 oC; time 1: 0'; Rate 1: 45 oC/min
 Temperatura 2: 190 oC; time 2: 13'; Rate 2: 15 oC/min
 Temperatura 3: 205 oC; time 3: 12'; Rate 3: 20 oC/min
 Temperatura 4: 260 oC; time 4: 18'
 Temp. del inyector: 100oC
 Temp. del detector: 330oC
 LIMITE DE DETECCION: 0,1 ng/l (ppb)

Los resultados se reflejan en los Cromatogramas adjunto, donde las concentraciones de los contaminantes (PCB'S), están por debajo de nuestros límites de detección (LD). Sin embargo, cabe destacar que en ciertas muestras se encontraron algunos contaminantes, los cuales fueron cuantificados, pero no identificados en forma específica sino de forma general; éstos pertenecen al grupo de los clorobencenos y ftalatos. La información puntual sobre este aspecto, requiere de otro proceso similar al empleado en la detección de PCB's,

<u>MUESTRA</u>	<u>TIPO DE ANALISIS</u>	<u>CONCENTRACION</u>
ww1 (03/6/94)	PCB's	n.d.
ww1 (17/6/94)	PCB's	n.d.
	Clorados	27 mg/l
ww2 (03/6/94)	PCB's	n.d.
	Clorados	0.63 mg/l
ww2 (17/6/94)	PCB's	n.d.
ww3 (03/6/94)	PCB's	n.d.
ww3 (17/6/94)	PCB's	n.d.
ww4 (03/6/94)	PCB's	n.d.
	Clorados	Trazas
ww4 (17/6/94)	PCB's	n.d.
ww5 (03/6/94)	PCB's	n.d.
ww5 (17/6/94)	PCB's	n.d.
	Clorados	32 mg/l
		0.9 ng/l

wg1 (18/5/94)	PCB's	n.d.
wg1 (19/5/94)	PCB's	n.d.
wg2 (18/5/94)	PCB's	n.d.
wg2 (31/5/94)	PCB's	n.d.
wg3 (24/5/94)	PCB's	n.d.
	Clorados	0.46 mg/l
wg3 (27/5/94)	PCB's	n.d.
wg4 (06/6/94)	PCB's	n.d.
wg4 (14/6/94)	PCB's	n.d.
wg5 (01/6/94)	PCB's	n.d.
wg5 (07/6/94)	PCB's	n.d.
wle1 (02/6/94)	PCB's	n.d.
wle1 (17/6/94)	PCB's	n.d.
wle2 (02/6/94)	PCB's	n.d.
wle2 (17/6/94)	PCB's	n.d.
	Clorados	0.92 mg/l
wle3 (02/6/94)	PCB's	n.d.
wle3 (17/6/94)	PCB's	n.d.
wle4 (02/6/94)	PCB's	n.d.
wle4 (17/6/94)	PCB's	n.d.
wla1 (02/6/94)	PCB's	n.d.
wla1 (17/6/94)	PCB's	n.d.
wla2 (02/6/94)	PCB's	n.d.
wla2 (17/6/94)	PCB's	n.d.
wla3 (02/6/94)	PCB's	n.d.
wla3 (17/6/94)	PCB's	n.d.
wla4 (02/6/94)	PCB's	n.d.
wla4 (17/6/94)	PCB's	n.d.
wla5 (02/6/94)	PCB's	n.d.
wla5 (17/6/94)	PCB's	n.d.
	Clorados	0.17 ng/l

Claves: n.d.: no detectado

mg/l: miligramos por litro (partes por millón).

ng/l: nanogramos por litro (partes por billón).

Nota: Los cromatogramas correspondientes a las muestras wg1 (19/5/94); wg2 (18/5/94); wg4 (6/6/94); wg5 (1/6/94); wle4 (17/6/94); wle2 (17/6/94); wla1 (2/6/94); wla1 (17/6/94); wla2 (2/6/94); wla2 (17/6/94); wla3 (2/6/94); wla3 (17/6/94) y wla4 (17/6/94), presentan algunas incongruencias en su línea base debido a los últimos cortes de energía que en un momento dado desestabilizó el detector ECD. Sin embargo, podemos asegurar la confiabilidad de los resultados, lo que se confirmó a través de otro laboratorio analítico existente en el país.

Cada uno de los tipos de análisis, están hechos en duplicado.

Sin más sobre el particular, me suscribo

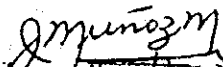
Ing. Juan Manuel Muñoz M.
Director General del PIDMA-UNI

cc:
arch.

Nota: Los cromatogramas correspondientes a las muestras wg1 (19/5/94); wg2 (18/5/94); wg4 (6/6/94); wg5 (1/6/94); wle4 (17/6/94); wle2 (17/6/94); wla1 (2/6/94); wla1 (17/6/94); wla2 (2/6/94); wla2 (17/6/94); wla3 (2/6/94); wla3 (17/6/94) y wla4 (17/6/94), presentan algunas incongruencias en su línea base debido a los últimos cortes de energía que en un momento dado desestabilizó el detector ECD. Sin embargo, podemos asegurar la confiabilidad de los resultados, lo que se confirmó a través de otro laboratorio analítico existente en el país.

Cada uno de los tipos de análisis, están hechos en duplicado.

Sin más sobre el particular, me suscribo


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UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

RESULTADOS DE CALIDAD DE AGUA MUESTREO No1. (02/06/94)
SEDIMENT

	Cu μg/lit	Zn g/lit	Cd mg/lit	As mg/lit	SS mg/lit	P mg/lit	Pb mg/lit	Hg mg/lit
DM1	86	3.3	0.00	0.07	372	0.00	0.27	0.45
DM2	128	0.00	0.00	0.02	324	700	0.15	0.28
DM3	20	6.3	0.00	0.05	3494	980	0.33	0.53
DA1	405	0.00	0.00	0.06	1536	1550	0.2	0.38
DA2	330	5.8	0.00	0.09	3365	1950	0.13	0.12
DA3	240	1.6	0.00	0.08	9104	850	0.16	0.25

Observación:

Los límites de detección para metales con interés toxicológico analizados por Espectrofotometría de Absorción Atómica son:

	<u>Generador de Hidruros</u>	<u>LLama</u>	<u>Grafito</u>
Pb	_____	15 µg/lit	_____
Hg	0.015 µg/lit	_____	_____
Cd	_____	_____	0.003µg/lit
As	0.03 µg/lit	_____	_____

- * Para el caso del Hg y As se utiliza absorción Atómica con generador de hidruros.
- * El Cd debido a su baja concentración se utilizó la técnica de Absorción Atómica con cámara de grafito.
- * En el caso del Pb se usó la técnica de Absorción Atómica con llama.

UNIVERSIDAD NACIONAL DE INGENIERIA

PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

ESTUDIOS DE CALIDAD DEL AIRE

- ESTUDIO DE SOLIDOS TOTALES EN SUSPENSION (SPM)

Coordinador del Equipo UNI :

Ing. Juan Manuel Muñoz Muñiz

Equipo Investigador :

Ing. Nabyarina Almendárez de Quezada

Managua, 28 de Junio de 1994

Introducción.

El muestreo y análisis para la determinación de partículas de sólidos totales en suspensión, se realizó entre los días 26 de mayo y 2 de junio de 1994, en un punto ubicado cerca de la entrada del Vertedero de Acahualinca de acuerdo a los términos de referencia contenidos en la petición de cotización del equipo JICA que realiza los estudios de Manejo de los Desechos Sólidos de la Ciudad de Managua y a los términos del contrato firmado por los Ingenieros KUSUNOKI del equipo JICA y JUAN M. MUÑOZ del PIDMA-UNI.

El equipo y metodología empleada fué adaptada para estos propósitos por la Ing. Nabyarina Almendárez de Quezada y se describe a continuación.

Material y Método Empleado.

El muestreo de Sólidos Totales en Suspensión en el aire se hizo por el método de filtración.

El equipo utilizado consistió de dos bombas de vacío que trabajaron alternadamente por períodos de doce horas durante los siete días de muestreo continuo, un captador de partículas (embudo de vidrio), filtro de papel (filtro usado en vehículos automotores para filtración de sólidos contenidos en gasolina) y mangueras de hule con diámetro ajustado a las dimensiones del filtro, embudo y tubos de succión de la bomba.

Estos equipos fueron sometidos a calibración y prueba en los laboratorios del PIDMA durante tres días, previo a la instalación en el local de toma de las muestras.

Debido a que las bombas trabajan con corriente alterna de 220 voltios se hizo una acometida especial para conectarlas en el lugar del muestreo.

El muestreo se hizo en forma continua durante las 24 horas de cada día y por siete días a una presión de succión constante de 200 mbar, realizándose chequeos del sistema dos veces por día como mínimo (cada 12 horas), siendo que en estas visitas se hacía el cambio de la conexión del sistema a la bomba. Para tener garantía de que el sistema estaría estable se entrenó a cuatro personas que permanecen en la vigilancia de las casetas en la regulación de las bombas.

La determinación del peso de los sólidos totales en suspensión del aire se hizo utilizando una balanza analítica y empleando la técnica de disección de las partes en contacto con el flujo de aire y en el filtro. Se utilizó una porción de algodón con peso conocido y se procedió a limpiar las partes antes referidas adhiriéndose las partículas de polvo al algodón, y se tomó el peso de ambos, luego se le restó el peso del algodón para obtener el peso del polvo en suspensión del aire captados en el muestreo.

Datos de la Medición y Resultados de Cálculos.

Datos:

- Peso de los Sólidos Totales en Suspensión = 0.2815 gr
 $P = 2.815 \times 10^5 \mu\text{g}.$
- Presión de succión de la bomba = 200 mbar = 2.039 m de H_2O
- Tiempo de succión Total = 7 días
- Cálculo del Volumen de aire succionado en los siete días:

a- velocidad del aire en el conducto de diámetro de 5mm.

$$U = \sqrt{2gh \left(\gamma_a / \gamma_f - 1 \right)} \quad [\text{m/s}]$$

$$\begin{aligned} h &= 2.039 \text{ m de } \text{H}_2\text{O} \\ \gamma_a &= 1000 \text{ kg/m}^3 \quad (\text{Peso específico del agua}) \\ \gamma_f &= 1.2 \text{ kg/m}^3 \quad (\text{Peso específico del aire}) \\ g &= 9.8 \text{ m/s}^2 \quad (\text{gravedad}) \end{aligned}$$

$$U = \sqrt{2 (9.8) (2.039) \left((1000 / 1.2) - 1 \right)} \quad [\text{m/s}]$$

$$U = 182.37 \text{ m/s}$$

b- Caudal de aire

$$Q = U A \quad [\text{m}^3/\text{s}] \quad (\text{Ecuación de Continuidad})$$

$$A = \pi r^2 = 3.1416 (0.0025)^2 = 0.000019635 \text{ m}^2$$

$$Q = 182.37 \text{ m/s} (0.000019635 \text{ m}^2) = 0.00358 \text{ m}^3/\text{s}$$

c- Volumen de aire succionado en los siete días

$$V = Q t \quad [\text{m}^3]$$

$$V = 0.00358 \text{ m}^3/\text{s} (7 \text{ d} \times 24 \text{ h/d} \times 3600 \text{ s/h}) = 2165.18 \text{ m}^3$$

- Cálculo de la Concentración de Sólidos totales en Suspensión

$$C = P/V \quad [\mu\text{g}/\text{m}^3] = 2.815 \times 10^5 \mu\text{g} / 2165.18 \text{ m}^3 = 130 \mu\text{g}/\text{m}^3$$

Según la Red Panamericana de Muestreo de la Contaminación del aire el nivel de referencia es de $100 \mu\text{g}/\text{m}^3$ (ver ANEXO)

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PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

ESTUDIOS DE CALIDAD DEL AIRE

- ESTUDIO DE PARTICULAS SEDIMENTABLES. (DUST)

Coordinador del Equipo UNI :

Ing. Juan Manuel Muñoz Muñiz, MSc.

Equipo Investigador :

Ing. Nabyarina Almendárez de Quezada, MSc.

Managua, 28 de Junio de 1994

Introducción.

El muestreo y análisis para la determinación de partículas Sedimentables del aire, se realizó entre los días 26 de mayo y 2 de junio de 1994, en un punto ubicado cerca de la entrada del Vertedero de Acahualinca de acuerdo a los términos de referencia contenidos en la petición de cotización del equipo JICA que realiza los estudios de Manejo de los Desechos Sólidos de la Ciudad de Managua y a los términos del contrato firmado por los Ingenieros KOUJI KUSUNOKI del equipo JICA y JUAN M. MUÑOZ del PIDMA-UNI.

Material y Método Empleado.

El muestreo de Partículas Sedimentables se hizo por el método de captación de tales partículas contenidas en una columna de aire de diámetro equivalente a la del recipiente utilizado.

El equipo consistió de una pana de plástico 23.85 cm de diámetro y de una estructura metálica consistente de una varilla de Acero corrugado de 5/8 de pulgadas de diámetro y 1.5 m de largo con platinas soldadas para facilitar su instalación y con un aro metálico de 1/2 pulgada de diámetro soldado a la varilla en posición tal que sirviera de base o sostén de la pana.

Este equipo se instaló en el local referido en la entrada del vertedero de Acahualinca a una altura de 2.5 m fijándose a la pared de una caseta de tal manera que la pana quedó en posición horizontal y con acceso libre a la columna de aire que se ve afectada por el régimen de viento.

Durante los siete días el muestreo fué continuo a excepción de los períodos de lluvia que en su conjunto sumó 18 horas y media. En estos períodos la pana se retiró de la estructura y se tapó, colocándose una vez finalizada la lluvia. Las horas de lluvia se registró de tal manera que al finalizar los siete días de muestreo se repuso este período.

La determinación del peso de los sólidos Sedimentables del aire se hizo utilizando una balanza analítica y empleando una porción de algodón con peso conocido con la que se limpió el interior de la pana para adherir a ella las partículas de polvo. Mediante el peso del algodón (sin partículas) y del algodón más partículas sedimentables se calculó el peso de las partículas sedimentable por simple diferencia de ambos pesos.

Datos de la Medición y Resultados de Cálculos.

Datos:

Diámetro de la Pana = 23.85 cm

Area de la Pana: $A = \pi r^2 = 3.1416 (23.85/2)^2 = 446.75 \text{ cm}^2$

Peso de la las Partículas Sedimentables = 80.80 mg (durante los siete días)

- Cálculo de la concentración de Partículas Sedimentable referido a un área de 1 cm^2 y a un período de 30 días.

Peso de Partículas Sedimentables por 30 días = 80.80 mg (30d/7d)
= 346.29 mg

Concentración = Peso de la Partículas Sedimentables en un período de treinta días dividido entre el Area de la Pana. [$\text{mg}/\text{cm}^2/30 \text{ días}$]

Concentración = $346.29 \text{ mg}/446.75 \text{ cm}^2 = 0.77 \text{ mg}/\text{cm}^2/30 \text{ días}$.

Según la Red Panamericana de Muestreo de la Contaminación del aire el nivel de referencia es de $0.50 \text{ mg}/\text{cm}^2/30 \text{ días}$.

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PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

ESTUDIOS DE CALIDAD AMBIENTAL

- ESTUDIO DE RUIDOS EN EL PUNTO N1.

Coordinador del Equipo UNI :

Ing. Juan Manuel Muñoz Muñiz

Participantes :

- José Ernesto Zeledón**
- Mauricio Pavón**

Managua, 9 de Junio de 1994

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PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 19/05/94									
Time : 8:00 am - 8:10 am									
Survey Point : N1									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	69.2	25	65.9	49	73.7	73	72.1	97	69.2
2	71.2	26	67.2	50	68.4	74	76.4	98	70.8
3	87.5	27	70.6	51	68.4	75	75.5	99	72.6
4	76.0	28	77.2	52	72.6	76	67.2	100	69.1
5	72.0	29	65.6	53	80.8	77	70.5	101	76.1
6	69.7	30	63.4	54	65.9	78	68.4	102	67.8
7	66.5	31	67.6	55	65.9	79	75.1	103	70.0
8	80.7	32	65.4	56	72.3	80	87.3	104	75.2
9	74.1	33	66.2	57	81.2	81	70.2	105	76.4
10	76.3	34	74.7	58	69.4	82	70.3	106	78.9
11	72.6	35	70.6	59	71.3	83	65.3	107	73.5
12	69.7	36	74.7	60	67.2	84	76.2	108	69.1
13	75.9	37	83.3	61	64.4	85	69.6	109	71.5
14	80.7	38	71.5	62	69.3	86	75.4	110	68.3
15	75.3	39	66.1	63	66.9	87	76.8	111	71.8
16	65.5	40	77.2	64	61.2	88	75.9	112	62.0
17	64.0	41	73.0	65	72.2	89	75.6	113	63.9
18	63.7	42	68.7	66	64.8	90	68.2	114	69.8
19	68.9	43	72.1	67	69.8	91	78.4	115	70.9
20	81.4	44	72.5	68	77.0	92	74.5	116	77.8
21	79.3	45	76.0	69	73.7	93	75.8	117	77.2
22	83.8	46	74.9	70	68.4	94	78.9	118	66.2
23	70.6	47	82.1	71	72.2	95	77.8	119	66.3
24	65.3	48	81.0	72	75.7	96	72.1	120	61.1

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PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 19/05/94									
Time : 9:00 am - 9:10 am									
Survey Point : N1									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	69.5	25	73.8	49	78.3	73	75.4	97	65.1
2	64.2	26	77.6	50	76.2	74	77.1	98	68.2
3	59.7	27	68.6	51	73.6	75	76.0	99	69.8
4	64.4	28	68.4	52	86.1	76	65.6	100	71.6
5	65.0	29	64.2	53	71.0	77	65.3	101	68.2
6	63.3	30	70.4	54	70.4	78	73.6	102	67.8
7	69.0	31	69.6	55	68.4	79	80.7	103	66.1
8	81.7	32	64.9	56	71.9	80	66.6	104	71.0
9	69.7	33	68.3	57	82.4	81	74.6	105	77.2
10	66.3	34	65.9	58	71.1	82	88.9	106	70.5
11	68.7	35	72.2	59	75.4	83	79.3	107	73.2
12	63.8	36	76.1	60	78.9	84	72.7	108	62.3
13	66.2	37	67.9	61	72.5	85	71.9	109	60.2
14	72.1	38	60.3	62	72.1	86	65.5	110	66.2
15	68.6	39	58.4	63	67.4	87	74.8	111	71.7
16	67.4	40	59.1	64	73.0	88	67.9	112	77.8
17	72.6	41	67.5	65	76.2	89	67.4	113	73.3
18	67.6	42	78.6	66	70.8	90	69.5	114	71.5
19	73.7	43	71.0	67	70.5	91	73.5	115	68.5
20	70.4	44	63.7	68	67.4	92	62.3	116	67.2
21	68.3	45	74.9	69	64.9	93	72.6	117	76.0
22	74.0	46	68.7	70	71.7	94	76.8	118	71.2
23	76.9	47	73.3	71	69.4	95	66.2	119	66.1
24	74.3	48	71.9	72	71.7	96	79.1	120	64.3

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		: 19/05/94							
Time		: 10:00 am - 10:10 am							
Survey Point		N1							
Name of Surveyor		: Mauricio R. Pavón M.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	68.2	25	69.0	49	68.0	73	70.9	97	69.3
2	72.6	26	70.4	50	66.8	74	65.5	98	61.1
3	66.3	27	76.7	51	62.6	75	58.7	99	68.0
4	72.7	28	70.5	52	61.8	76	71.5	100	64.4
5	74.8	29	74.4	53	68.0	77	68.6	101	72.2
6	69.2	30	68.2	54	64.3	78	65.8	102	78.6
7	69.1	31	69.8	55	63.4	79	73.2	103	65.0
8	67.9	32	70.5	56	73.1	80	78.6	104	68.7
9	61.9	33	77.9	57	73.7	81	76.1	105	64.4
10	60.6	34	77.6	58	78.3	82	73.7	106	67.2
11	63.7	35	68.5	59	64.5	83	68.4	107	69.1
12	73.2	36	71.1	60	60.7	84	67.3	108	71.2
13	68.4	37	78.1	61	68.9	85	65.8	109	81.1
14	80.0	38	72.1	62	67.2	86	59.1	110	73.7
15	73.9	39	76.1	63	74.6	87	58.0	111	66.8
16	72.0	40	73.7	64	66.3	88	63.4	112	69.0
17	74.6	41	72.8	65	61.2	89	72.1	113	79.3
18	70.6	42	67.0	66	61.5	90	68.3	114	70.6
19	69.3	43	75.8	67	66.9	91	72.6	115	70.5
20	70.7	44	77.1	68	68.4	92	68.7	116	75.5
21	72.0	45	76.2	69	70.3	93	67.3	117	62.9
22	66.9	46	63.5	70	72.8	94	72.1	118	61.6
23	73.6	47	71.9	71	77.9	95	63.0	119	67.9
24	64.7	48	68.7	72	70.2	96	60.2	120	68.8

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 19/05/94									
Time : 11:00 am - 11:10 am									
Survey Point : N1									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	68.8	25	63.2	49	69.8	73	75.4	97	59.9
2	84.9	26	67.5	50	65.9	74	69.4	98	60.9
3	69.4	27	75.8	51	71.7	75	71.7	99	60.6
4	78.4	28	78.3	52	71.3	76	70.2	100	65.0
5	71.4	29	73.7	53	71.7	77	67.8	101	71.7
6	77.0	30	68.0	54	73.5	78	64.7	102	71.2
7	67.0	31	71.9	55	64.0	79	76.2	103	64.7
8	67.7	32	62.9	56	62.1	80	66.3	104	66.8
9	64.0	33	60.6	57	74.0	81	70.3	105	64.8
10	66.5	34	68.0	58	68.0	82	69.4	106	65.8
11	72.0	35	71.9	59	69.4	83	71.6	107	64.3
12	68.0	36	69.1	60	73.2	84	64.3	108	69.6
13	63.9	37	75.2	61	70.8	85	65.7	109	80.0
14	71.9	38	77.6	62	70.9	86	70.5	110	75.5
15	68.9	39	67.3	63	67.2	87	72.5	111	75.9
16	73.9	40	68.1	64	72.5	88	68.2	112	69.1
17	71.8	41	69.3	65	73.1	89	69.7	113	64.3
18	72.1	42	66.5	66	72.6	90	72.8	114	64.6
19	76.0	43	65.2	67	68.6	91	72.9	115	71.7
20	72.0	44	66.9	68	66.4	92	79.9	116	71.2
21	68.4	45	76.1	69	70.4	93	72.0	117	72.2
22	68.8	46	80.9	70	77.3	94	75.3	118	72.3
23	71.5	47	64.6	71	78.8	95	71.6	119	65.5
24	63.2	48	69.5	72	70.4	96	60.8	120	69.7

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		: 19/05/94							
Time		: 12:00 m - 12:10 am							
Survey Point		: N1							
Name of Surveyor		: Mauricio R. Pavón M.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	70.7	25	74.7	49	66.6	73	68.0	97	71.6
2	70.5	26	70.7	50	67.6	74	65.8	98	83.2
3	75.0	27	70.3	51	56.0	75	61.8	99	80.0
4	72.2	28	69.7	52	59.7	76	64.1	100	67.9
5	78.4	29	73.4	53	68.9	77	65.1	101	62.8
6	72.4	30	66.9	54	64.8	78	70.7	102	74.6
7	67.2	31	71.7	55	63.2	79	77.0	103	75.0
8	72.4	32	68.5	56	63.1	80	70.1	104	67.7
9	70.8	33	73.8	57	64.3	81	78.1	105	62.8
10	67.7	34	71.4	58	75.5	82	64.2	106	63.6
11	62.4	35	70.3	59	81.2	83	72.1	107	57.4
12	61.1	36	75.8	60	66.9	84	65.7	108	64.3
13	60.8	37	71.7	61	66.8	85	65.4	109	66.4
14	71.5	38	78.6	62	68.4	86	66.9	110	67.6
15	77.8	39	73.6	63	63.3	87	74.2	111	66.2
16	73.4	40	66.2	64	63.3	88	78.2	112	67.6
17	74.9	41	68.4	65	69.1	89	79.8	113	70.7
18	67.9	42	70.8	66	67.4	90	57.6	114	69.4
19	63.9	43	69.0	67	78.7	91	60.7	115	61.2
20	70.6	44	65.5	68	67.2	92	80.8	116	76.3
21	66.7	45	72.6	69	74.6	93	61.8	117	75.7
22	71.1	46	68.3	70	70.6	94	70.6	118	67.9
23	72.3	47	74.2	71	68.9	95	62.7	119	72.0
24	66.2	48	70.2	72	72.0	96	67.7	120	69.0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 19/05/94									
Time : 1:00 pm - 1:10 pm									
Survey Point : N1									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	60.7	25	73.3	49	74.4	73	68.2	97	64.9
2	54.4	26	74.4	50	68.7	74	69.5	98	82.1
3	57.9	27	73.5	51	62.6	75	66.1	99	58.8
4	62.3	28	72.8	52	67.3	76	70.7	100	69.8
5	69.0	29	67.2	53	71.7	77	79.1	101	68.1
6	68.7	30	71.2	54	62.9	78	69.6	102	60.1
7	62.9	31	66.4	55	70.2	79	61.8	103	65.4
8	72.8	32	63.5	56	63.7	80	68.0	104	74.7
9	63.9	33	68.2	57	58.7	81	59.5	105	75.0
10	71.7	34	63.3	58	65.6	82	63.6	106	66.9
11	73.1	35	59.2	59	62.0	83	67.2	107	70.2
12	68.2	36	68.7	60	67.0	84	61.5	108	71.7
13	64.7	37	75.5	61	71.3	85	67.1	109	77.4
14	60.3	38	58.1	62	68.2	86	72.7	110	75.7
15	65.1	39	58.4	63	74.0	87	63.6	111	73.3
16	60.5	40	76.8	64	62.8	88	60.8	112	69.7
17	64.5	41	72.8	65	56.9	89	64.8	113	78.3
18	73.5	42	64.6	66	56.8	90	68.5	114	72.4
19	71.4	43	63.8	67	67.4	91	69.3	115	65.4
20	70.0	44	65.3	68	70.3	92	68.3	116	68.1
21	69.0	45	61.4	69	58.6	93	64.7	117	64.6
22	71.6	46	61.1	70	63.6	94	60.7	118	71.2
23	68.5	47	64.2	71	70.8	95	73.1	119	77.7
24	68.4	48	70.9	72	61.9	96	74.8	120	70.2

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		: 19/05/94							
Time		: 2:00 pm - 2:10 am							
Survey Point		: N1							
Name of Surveyor		: Mauricio R. Pavón M.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	62.1	25	63.3	49	70.5	73	57.2	97	69.9
2	61.9	26	62.6	50	65.1	74	68.8	98	63.6
3	64.7	27	67.3	51	71.1	75	77.9	99	69.4
4	66.3	28	70.0	52	62.8	76	71.6	100	61.9
5	63.6	29	76.0	53	53.9	77	69.5	101	72.2
6	66.8	30	76.8	54	54.1	78	69.6	102	58.0
7	70.2	31	65.3	55	55.4	79	63.1	103	60.5
8	74.3	32	58.4	56	53.9	80	74.4	104	58.1
9	72.8	33	59.2	57	63.1	81	77.9	105	54.1
10	66.7	34	77.6	58	61.7	82	70.7	106	60.0
11	66.9	35	70.5	59	71.3	83	71.6	107	72.1
12	68.8	36	63.3	60	62.4	84	67.0	108	59.4
13	66.9	37	63.7	61	73.8	85	64.2	109	63.3
14	67.7	38	57.4	62	74.3	86	64.0	110	64.8
15	62.4	39	80.4	63	68.5	87	72.3	111	60.7
16	62.5	40	58.3	64	75.3	88	61.9	112	69.8
17	63.6	41	54.4	65	78.8	89	64.8	113	64.7
18	69.2	42	69.8	66	71.1	90	71.3	114	70.1
19	63.9	43	63.7	67	84.9	91	63.9	115	53.5
20	60.8	44	58.3	68	75.2	92	74.8	116	58.0
21	68.0	45	59.0	69	61.5	93	75.6	117	74.0
22	66.5	46	70.5	70	56.9	94	68.8	118	69.3
23	60.1	47	63.7	71	71.7	95	75.3	119	68.8
24	61.4	48	64.2	72	57.8	96	64.8	120	73.3

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		: 19/05/94							
Time		: 3:00 pm - 3:10 am							
Survey Point		: N1							
Name of Surveyor		: Mauricio R. Pavón M.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	69.1	25	64.9	49	65.6	73	64.7	97	56.5
2	59.7	26	71.6	50	61.8	74	65.3	98	67.1
3	64.6	27	75.8	51	61.4	75	69.2	99	60.1
4	63.8	28	76.6	52	66.2	76	76.3	100	68.6
5	63.3	29	65.2	53	76.1	77	71.1	101	54.0
6	65.8	30	66.8	54	70.1	78	71.9	102	53.0
7	65.0	31	71.6	55	67.5	79	71.8	103	54.7
8	67.3	32	73.5	56	63.2	80	68.5	104	51.9
9	68.3	33	64.7	57	59.7	81	68.5	105	53.5
10	66.4	34	65.5	58	63.0	82	72.1	106	57.0
11	70.9	35	64.9	59	70.1	83	66.2	107	82.1
12	82.5	36	64.2	60	70.4	84	76.8	108	64.1
13	80.4	37	67.9	61	68.6	85	65.5	109	60.8
14	67.8	38	72.4	62	85.7	86	61.2	110	63.1
15	67.6	39	70.5	63	90.8	87	61.9	111	72.7
16	61.0	40	64.6	64	70.7	88	73.6	112	67.8
17	61.5	41	63.3	65	72.4	89	65.4	113	68.5
18	73.7	42	66.1	66	71.1	90	64.7	114	67.6
19	72.1	43	69.0	67	65.5	91	70.3	115	71.0
20	65.5	44	69.4	68	76.9	92	68.8	116	66.2
21	66.2	45	79.2	69	68.5	93	73.3	117	58.2
22	65.2	46	83.0	70	74.3	94	71.8	118	61.4
23	69.8	47	71.2	71	80.0	95	65.2	119	66.5
24	71.3	48	71.2	72	71.1	96	60.7	120	69.8

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		: 19/05/94							
Time		: 4:00 pm - 4:10 am							
Survey Point		: N1							
Name of Surveyor		: Mauricio R. Pavón M.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	77.6	25	58.7	49	71.7	73	72.7	97	75.9
2	67.3	26	70.0	50	67.1	74	73.0	98	78.0
3	80.8	27	68.6	51	70.9	75	74.5	99	69.0
4	71.5	28	69.8	52	70.1	76	77.6	100	70.1
5	77.8	29	74.2	53	66.8	77	81.6	101	73.0
6	80.3	30	64.3	54	70.1	78	75.7	102	70.6
7	74.0	31	64.3	55	65.8	79	70.2	103	73.6
8	64.4	32	66.6	56	71.6	80	65.7	104	76.8
9	64.4	33	70.4	57	71.3	81	75.2	105	71.5
10	68.4	34	64.7	58	70.9	82	75.8	106	74.7
11	87.0	35	71.8	59	82.4	83	63.3	107	78.2
12	67.0	36	66.5	60	80.4	84	64.7	108	69.4
13	67.1	37	66.4	61	73.4	85	69.5	109	73.2
14	62.4	38	72.5	62	73.3	86	61.6	110	68.4
15	63.5	39	64.0	63	66.4	87	68.1	111	66.4
16	57.8	40	71.0	64	72.8	88	65.8	112	70.1
17	65.2	41	72.5	65	65.2	89	73.1	113	76.9
18	70.7	42	66.5	66	73.9	90	72.8	114	79.1
19	69.7	43	68.0	67	72.4	91	71.5	115	66.7
20	67.7	44	61.8	68	71.1	92	71.4	116	61.2
21	67.5	45	65.4	69	78.0	93	64.2	117	63.5
22	77.8	46	70.4	70	80.8	94	55.0	118	62.8
23	63.7	47	71.9	71	69.3	95	66.5	119	65.1
24	58.9	48	79.6	72	70.8	96	54.7	120	63.7

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 19/05/94									
Time : 5:00 pm - 5:10 pm									
Survey Point : N1									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	68.5	25	62.9	49	72.0	73	63.1	97	72.7
2	65.7	26	67.2	50	73.9	74	66.9	98	62.0
3	77.2	27	65.0	51	80.3	75	58.3	99	64.8
4	68.6	28	61.0	52	78.4	76	59.4	100	66.1
5	72.4	29	61.6	53	73.0	77	63.3	101	80.1
6	77.7	30	64.0	54	74.6	78	66.4	102	74.8
7	65.7	31	68.0	55	81.6	79	64.4	103	71.3
8	77.9	32	69.7	56	82.6	80	77.7	104	64.9
9	70.3	33	75.2	57	74.4	81	64.1	105	64.3
10	60.5	34	73.6	58	70.2	82	70.8	106	74.3
11	69.3	35	64.3	59	67.5	83	63.3	107	72.4
12	68.2	36	79.7	60	61.5	84	57.8	108	73.3
13	67.1	37	64.5	61	66.6	85	66.0	109	67.8
14	69.4	38	61.3	62	67.2	86	64.8	110	63.8
15	67.7	39	73.3	63	70.0	87	68.1	111	66.8
16	80.6	40	79.9	64	83.7	88	65.0	112	69.3
17	70.9	41	86.3	65	74.1	89	69.1	113	66.5
18	72.9	42	58.4	66	71.1	90	67.7	114	58.4
19	64.9	43	59.2	67	72.5	91	74.0	115	58.7
20	66.6	44	82.1	68	64.5	92	68.9	116	61.0
21	76.0	45	91.0	69	65.9	93	73.2	117	61.5
22	66.5	46	74.8	70	69.1	94	66.3	118	71.9
23	68.3	47	87.8	71	71.9	95	77.7	119	71.8
24	62.6	48	67.0	72	66.1	96	65.6	120	72.9

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		: 19/05/94							
Time		: 6:00 pm - 6:10 pm							
Survey Point		: N1							
Name of Surveyor		: Mauricio R. Pavón M.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	69.6	25	67.9	49	69.4	73	68.8	97	67.0
2	67.7	26	68.6	50	63.6	74	68.6	98	62.2
3	69.8	27	74.7	51	62.7	75	61.9	99	63.7
4	77.0	28	65.1	52	67.6	76	61.5	100	65.6
5	57.9	29	64.3	53	70.7	77	73.8	101	73.0
6	66.4	30	71.8	54	82.0	78	68.6	102	88.8
7	68.5	31	69.4	55	76.6	79	61.2	103	77.3
8	67.2	32	75.3	56	82.5	80	62.7	104	64.9
9	72.6	33	69.6	57	69.2	81	61.0	105	68.7
10	72.7	34	68.3	58	69.8	82	63.4	106	62.8
11	77.3	35	81.0	59	67.0	83	73.5	107	62.6
12	75.8	36	69.1	60	65.2	84	65.0	108	63.0
13	65.0	37	77.9	61	69.1	85	68.3	109	64.3
14	70.9	38	67.3	62	62.6	86	76.1	110	69.5
15	74.0	39	67.9	63	73.8	87	75.4	111	71.0
16	68.7	40	65.1	64	74.2	88	73.6	112	69.4
17	77.8	41	69.7	65	75.3	89	72.4	113	67.8
18	81.6	42	69.0	66	69.1	90	69.2	114	66.6
19	87.6	43	67.5	67	73.1	91	74.3	115	66.6
20	76.7	44	81.1	68	63.0	92	78.7	116	64.8
21	73.0	45	94.9	69	64.0	93	76.5	117	70.1
22	72.7	46	84.6	70	65.7	94	72.4	118	66.2
23	84.1	47	80.8	71	78.5	95	65.1	119	71.2
24	67.0	48	78.5	72	68.0	96	68.0	120	68.6

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		: 19/05/94							
Time		: 7:00 pm - 7:10 pm							
Survey Point		: N1							
Name of Surveyor		: Mauricio R. Pavón M.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	64.2	25	63.8	49	67.2	73	64.2	97	71.4
2	64.6	26	63.3	50	65.2	74	68.8	98	64.6
3	77.6	27	63.4	51	67.5	75	68.4	99	65.5
4	93.0	28	63.7	52	62.9	76	68.0	100	64.9
5	76.5	29	66.3	53	65.7	77	65.0	101	68.9
6	64.0	30	65.9	54	66.2	78	67.6	102	67.0
7	74.2	31	62.6	55	67.7	79	64.1	103	64.1
8	79.4	32	63.4	56	84.8	80	63.3	104	65.4
9	66.0	33	66.1	57	86.6	81	64.9	105	66.4
10	64.8	34	64.2	58	74.3	82	72.1	106	64.2
11	65.0	35	65.0	59	72.4	83	71.1	107	62.9
12	64.6	36	67.8	60	69.6	84	63.2	108	64.1
13	68.7	37	72.5	61	73.1	85	63.8	109	66.0
14	64.9	38	65.3	62	67.5	86	67.3	110	64.0
15	62.3	39	69.6	63	67.3	87	68.0	111	63.7
16	66.2	40	72.3	64	63.5	88	67.8	112	64.3
17	68.3	41	69.6	65	64.4	89	65.9	113	63.2
18	63.9	42	67.7	66	63.6	90	67.2	114	66.5
19	64.1	43	65.6	67	68.7	91	67.5	115	65.8
20	64.0	44	62.6	68	63.8	92	65.7	116	71.6
21	63.7	45	62.4	69	69.6	93	74.6	117	69.3
22	73.2	46	65.3	70	69.8	94	69.5	118	70.0
23	62.9	47	66.0	71	70.5	95	63.9	119	66.5
24	64.0	48	66.5	72	63.8	96	69.3	120	66.5

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		: 19/05/94							
Time		: 8:00 pm - 8:10 pm							
Survey Point		: N1							
Name of Surveyor		: Mauricio R. Pavón M.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	71.0	25	60.4	49	59.7	73	57.4	97	66.7
2	67.2	26	63.0	50	59.1	74	56.4	98	69.9
3	71.3	27	64.3	51	61.4	75	57.2	99	69.4
4	61.4	28	60.2	52	73.3	76	58.1	100	73.4
5	58.0	29	75.3	53	66.0	77	64.5	101	70.4
6	55.7	30	71.0	54	59.6	78	72.0	102	59.1
7	57.5	31	70.1	55	65.9	79	65.5	103	66.2
8	67.3	32	74.1	56	67.1	80	60.5	104	58.7
9	64.9	33	72.4	57	78.6	81	67.6	105	66.1
10	59.5	34	63.7	58	74.4	82	64.0	106	69.2
11	60.5	35	62.6	59	57.7	83	65.0	107	60.0
12	57.2	36	69.7	60	58.1	84	64.3	108	57.1
13	61.3	37	64.6	61	67.6	85	67.3	109	68.2
14	64.0	38	61.5	62	58.7	86	64.6	110	61.1
15	58.7	39	62.3	63	61.5	87	71.6	111	56.8
16	64.4	40	59.4	64	59.8	88	62.2	112	62.3
17	66.2	41	69.0	65	56.4	89	62.8	113	60.2
18	58.0	42	65.3	66	60.1	90	61.4	114	68.0
19	63.4	43	60.8	67	59.0	91	72.9	115	69.6
20	58.8	44	66.1	68	61.7	92	69.5	116	65.0
21	59.9	45	59.7	69	63.4	93	59.0	117	60.7
22	65.5	46	63.6	70	60.9	94	57.0	118	66.4
23	60.3	47	61.5	71	62.9	95	57.3	119	67.0
24	68.5	48	58.6	72	58.2	96	56.2	120	60.5

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		: 19/05/94							
Time		: 9:00 - 9:10 pm							
Survey Point		: N1							
Name of Surveyor		: Jose Ernesto Zeledon Rivera.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	55.9	25	69.4	49	58.5	73	60.2	97	59.6
2	59.4	26	66.4	50	54.8	74	60.5	98	58.9
3	51.9	27	61.6	51	54.6	75	56.4	99	58.2
4	54.3	28	64.8	52	55.7	76	67.6	100	63.3
5	63.3	29	61.9	53	62.6	77	66.0	101	61.6
6	63.6	30	61.4	54	57.2	78	71.1	102	60.8
7	68.1	31	63.1	55	53.7	79	68.6	103	58.6
8	71.6	32	73.4	56	54.7	80	64.9	104	60.3
9	82.8	33	60.0	57	52.9	81	58.8	105	67.6
10	66.2	34	59.0	58	55.9	82	55.2	106	61.7
11	70.2	35	54.8	59	66.6	83	54.1	107	67.9
12	60.4	36	54.2	60	54.7	84	56.2	108	67.8
13	62.1	37	56.0	61	51.7	85	58.0	109	61.7
14	60.3	38	53.7	62	53.2	86	61.5	110	58.8
15	63.4	39	61.3	63	54.2	87	57.0	111	63.3
16	70.7	40	57.7	64	49.4	88	60.8	112	58.9
17	66.8	41	57.7	65	51.7	89	66.2	113	67.3
18	61.3	42	59.3	66	55.2	90	72.8	114	63.9
19	56.2	43	68.2	67	56.1	91	65.3	115	60.2
20	55.5	44	68.8	68	58.8	92	65.2	116	60.9
21	64.4	45	68.8	69	59.5	93	63.7	117	66.1
22	65.1	46	57.7	70	55.3	94	61.6	118	68.2
23	70.3	47	61.2	71	55.7	95	61.6	119	79.0
24	73.1	48	61.9	72	56.2	96	59.9	120	76.8

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 19/05/94									
Time : 10:00 - 10:10 pm									
Survey Point : N1									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	61.7	25	66.0	49	59.3	73	62.0	97	70.5
2	57.0	26	61.1	50	60.7	74	57.0	98	62.9
3	66.9	27	56.8	51	52.3	75	62.6	99	55.2
4	65.2	28	58.2	52	57.0	76	66.0	100	58.3
5	62.7	29	57.6	53	55.6	77	72.9	101	62.1
6	66.0	30	59.4	54	52.6	78	79.5	102	60.5
7	54.4	31	64.4	55	58.6	79	73.0	103	59.1
8	56.3	32	62.8	56	56.3	80	67.5	104	60.0
9	57.4	33	61.3	57	49.2	81	68.8	105	54.1
10	53.0	34	66.1	58	50.5	82	60.5	106	51.4
11	52.9	35	64.3	59	54.6	83	69.1	107	63.0
12	55.8	36	66.3	60	55.5	84	67.4	108	52.2
13	56.6	37	77.6	61	58.4	85	65.7	109	55.2
14	73.8	38	67.9	62	56.7	86	56.4	110	56.0
15	60.5	39	63.4	63	64.3	87	55.5	111	61.5
16	64.4	40	68.3	64	58.1	88	63.7	112	67.5
17	56.2	41	63.2	65	59.0	89	57.1	113	68.5
18	53.3	42	69.0	66	54.4	90	58.1	114	69.1
19	52.1	43	58.4	67	57.0	91	55.2	115	63.7
20	51.2	44	62.0	68	65.4	92	57.3	116	66.7
21	53.2	45	59.4	69	59.9	93	56.7	117	78.6
22	54.9	46	65.5	70	53.8	94	66.9	118	72.5
23	63.2	47	67.3	71	60.7	95	66.3	119	64.6
24	57.6	48	71.6	72	60.4	96	66.6	120	62.4

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		19/05/94							
Time		11:00 - 11:10 pm							
Survey Point		N1							
Name of Surveyor		Jose Ernesto Zeledon Rivera.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	64.1	25	65.5	49	54.3	73	58.6	97	47.1
2	68.8	26	64.3	50	59.0	74	54.6	98	49.2
3	54.2	27	57.7	51	70.5	75	50.9	99	52.3
4	59.4	28	59.2	52	59.8	76	52.9	100	58.0
5	55.8	29	67.0	53	54.0	77	54.6	101	71.1
6	51.0	30	67.5	54	56.5	78	48.4	102	60.3
7	51.7	31	63.1	55	59.1	79	46.8	103	53.2
8	51.5	32	56.8	56	61.8	80	48.5	104	54.5
9	51.1	33	54.9	57	55.6	81	47.8	105	60.8
10	50.0	34	50.8	58	58.9	82	51.9	106	58.2
11	48.5	35	49.9	59	66.0	83	54.3	107	60.4
12	48.1	36	63.2	60	58.9	84	62.4	108	62.6
13	46.6	37	64.4	61	55.4	85	55.5	109	56.1
14	47.8	38	73.7	62	53.0	86	54.8	110	57.2
15	52.7	39	50.9	63	50.6	87	56.5	111	61.4
16	68.7	40	63.8	64	54.4	88	50.4	112	69.1
17	61.8	41	57.9	65	56.3	89	49.3	113	53.7
18	56.8	42	47.9	66	52.8	90	51.1	114	56.0
19	50.9	43	50.1	67	59.7	91	51.1	115	55.2
20	50.4	44	47.2	68	74.5	92	50.1	116	52.0
21	49.5	45	48.5	69	57.9	93	48.3	117	48.8
22	49.6	46	51.9	70	56.1	94	48.6	118	47.8
23	54.6	47	70.0	71	52.4	95	47.8	119	48.8
24	59.1	48	51.4	72	61.3	96	47.4	120	46.7

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		: 19/05/94							
Time		: 12:00 pm - 0:10 am							
Survey Point		: N1							
Name of Surveyor		: Jose Ernesto Zeledon Rivera.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	44.6	25	56.2	49	50.5	73	44.2	97	47.4
2	49.2	26	56.2	50	44.6	74	47.5	98	43.9
3	51.7	27	54.2	51	44.7	75	51.7	99	44.8
4	44.2	28	50.8	52	53.6	76	54.3	100	43.2
5	43.3	29	52.3	53	42.4	77	63.5	101	41.8
6	43.0	30	47.7	54	45.5	78	54.7	102	43.2
7	45.6	31	47.0	55	44.0	79	49.5	103	46.9
8	43.0	32	47.1	56	45.1	80	48.0	104	44.8
9	42.9	33	44.8	57	44.5	81	47.6	105	46.8
10	42.8	34	42.6	58	44.8	82	45.7	106	43.5
11	40.2	35	43.9	59	47.5	83	42.5	107	42.2
12	43.3	36	45.8	60	49.9	84	43.9	108	45.0
13	46.1	37	45.7	61	42.5	85	44.4	109	45.2
14	46.9	38	46.3	62	48.4	86	44.1	110	44.3
15	49.3	39	46.8	63	43.9	87	43.9	111	46.6
16	49.9	40	50.0	64	43.3	88	44.6	112	48.3
17	47.0	41	50.6	65	41.3	89	44.3	113	53.9
18	49.2	42	58.1	66	40.2	90	47.7	114	54.9
19	52.3	43	56.0	67	41.1	91	43.7	115	54.0
20	61.0	44	49.2	68	48.2	92	44.9	116	51.4
21	63.4	45	49.3	69	44.7	93	45.1	117	50.6
22	60.5	46	47.6	70	43.6	94	45.4	118	49.7
23	55.7	47	46.4	71	42.1	95	45.7	119	52.2
24	58.2	48	46.4	72	48.2	96	43.2	120	40.5

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 20/05/94									
Time : 1:00 am - 1:10 am									
Survey Point : N1									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	55.4	25	53.3	49	44.3	73	47.9	97	69.8
2	52.0	26	53.2	50	39.5	74	45.6	98	78.3
3	49.0	27	52.6	51	39.4	75	45.2	99	71.9
4	43.3	28	50.3	52	40.0	76	42.8	100	65.6
5	42.5	29	47.7	53	40.6	77	42.4	101	57.8
6	40.1	30	47.6	54	40.5	78	44.4	102	56.6
7	42.0	31	44.6	55	39.7	79	43.5	103	60.5
8	40.6	32	53.8	56	40.1	80	40.6	104	62.9
9	42.1	33	61.7	57	49.3	81	40.3	105	55.2
10	41.6	34	52.4	58	43.2	82	40.8	106	65.8
11	40.8	35	47.1	59	40.1	83	39.9	107	64.7
12	40.0	36	51.1	60	40.6	84	43.3	108	68.8
13	39.1	37	49.5	61	41.3	85	41.1	109	59.4
14	38.7	38	56.9	62	40.7	86	44.5	110	53.1
15	40.3	39	59.1	63	41.2	87	44.3	111	56.7
16	40.4	40	46.1	64	43.5	88	43.5	112	50.1
17	40.4	41	46.1	65	46.2	89	42.1	113	55.7
18	40.7	42	45.5	66	52.3	90	43.8	114	63.2
19	41.5	43	44.0	67	66.0	91	45.0	115	61.3
20	43.4	44	42.8	68	59.6	92	49.7	116	43.3
21	44.1	45	41.1	69	56.4	93	52.0	117	43.7
22	45.1	46	39.5	70	54.6	94	51.2	118	50.0
23	45.3	47	40.1	71	51.4	95	50.4	119	45.6
24	52.0	48	39.9	72	47.6	96	58.9	120	54.4

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		20/05/94							
Time		2:00 am - 2:10 am							
Survey Point		N1							
Name of Surveyor		Jose Ernesto Zeledon Rivera.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	50.8	25	42.2	49	56.1	73	43.0	97	42.7
2	45.2	26	43.7	50	52.1	74	40.9	98	42.7
3	46.6	27	42.5	51	51.1	75	40.6	99	40.9
4	49.9	28	41.2	52	51.3	76	41.1	100	42.2
5	42.9	29	41.5	53	48.3	77	40.7	101	43.5
6	46.5	30	41.0	54	48.0	78	41.4	102	42.3
7	42.6	31	42.3	55	42.0	79	41.3	103	41.8
8	41.2	32	42.7	56	40.6	80	41.7	104	41.9
9	41.7	33	43.3	57	40.2	81	41.7	105	42.7
10	42.8	34	43.1	58	40.8	82	41.3	106	42.4
11	45.2	35	43.2	59	40.7	83	41.0	107	42.5
12	42.7	36	44.9	60	42.0	84	42.0	108	41.9
13	40.9	37	48.6	61	40.8	85	42.7	109	41.9
14	41.5	38	59.2	62	42.7	86	42.3	110	41.1
15	40.8	39	50.4	63	43.7	87	44.6	111	44.9
16	40.7	40	54.8	64	41.7	88	42.5	112	41.0
17	40.5	41	54.1	65	40.7	89	42.7	113	42.2
18	40.7	42	53.2	66	41.7	90	42.2	114	42.7
19	41.1	43	53.7	67	43.7	91	41.8	115	42.6
20	41.5	44	48.7	68	41.6	92	41.1	116	41.6
21	41.7	45	45.7	69	40.9	93	41.9	117	40.4
22	41.1	46	51.3	70	42.1	94	41.6	118	40.9
23	40.4	47	56.5	71	40.0	95	42.1	119	41.5
24	40.4	48	64.5	72	42.1	96	44.0	120	40.5

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 20/05/94									
Time : 3:00 am - 3:10 am									
Survey Point : N1									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	41.8	25	44.8	49	44.7	73	42.9	97	41.0
2	51.9	26	49.0	50	44.1	74	43.7	98	40.1
3	52.2	27	52.0	51	43.8	75	43.4	99	40.4
4	42.4	28	45.4	52	42.8	76	43.0	100	40.7
5	50.7	29	44.6	53	43.1	77	42.3	101	41.3
6	43.6	30	44.3	54	43.5	78	41.8	102	48.3
7	42.7	31	44.8	55	43.2	79	42.3	103	40.5
8	43.4	32	47.0	56	42.7	80	42.1	104	40.2
9	42.4	33	44.1	57	42.3	81	42.2	105	48.7
10	42.9	34	45.2	58	43.1	82	42.1	106	40.3
11	46.4	35	44.5	59	42.1	83	41.5	107	39.7
12	42.5	36	44.5	60	43.0	84	43.1	108	40.3
13	45.8	37	44.5	61	44.6	85	41.6	109	42.3
14	46.9	38	51.5	62	42.8	86	41.8	110	40.3
15	43.3	39	45.2	63	42.7	87	41.1	111	42.6
16	42.9	40	44.2	64	43.6	88	40.1	112	40.6
17	45.1	41	44.1	65	46.6	89	47.3	113	45.9
18	42.6	42	48.4	66	44.1	90	40.4	114	43.8
19	48.4	43	44.4	67	41.9	91	40.7	115	39.9
20	43.3	44	44.2	68	42.2	92	40.9	116	41.2
21	44.0	45	45.8	69	41.9	93	40.9	117	40.2
22	43.4	46	46.4	70	41.9	94	40.2	118	42.0
23	55.3	47	45.2	71	42.9	95	40.1	119	40.7
24	45.1	48	45.0	72	41.9	96	41.8	120	48.6

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 20/05/94									
Time : 4:00 am - 4:10 am									
Survey Point : N1									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	53.7	25	47.3	49	54.2	73	54.6	97	41.9
2	58.8	26	43.8	50	64.1	74	54.2	98	42.6
3	63.3	27	53.9	51	54.9	75	59.4	99	60.1
4	64.4	28	40.8	52	55.6	76	54.3	100	41.6
5	53.6	29	48.8	53	63.4	77	51.7	101	42.1
6	53.5	30	41.1	54	60.4	78	49.6	102	43.1
7	54.2	31	51.8	55	53.0	79	48.5	103	43.2
8	55.0	32	48.9	56	51.7	80	46.9	104	41.3
9	55.2	33	43.1	57	49.6	81	44.3	105	45.0
10	67.8	34	43.5	58	54.9	82	40.5	106	49.4
11	60.8	35	64.2	59	60.7	83	43.4	107	42.5
12	55.9	36	41.9	60	62.6	84	41.4	108	41.7
13	54.7	37	42.4	61	53.4	85	41.3	109	49.0
14	50.2	38	43.1	62	53.8	86	42.8	110	41.2
15	48.1	39	42.6	63	48.3	87	42.1	111	42.1
16	48.8	40	42.2	64	47.3	88	40.5	112	42.6
17	45.8	41	42.1	65	48.4	89	40.0	113	44.1
18	43.5	42	43.7	66	46.6	90	39.5	114	42.4
19	47.0	43	48.7	67	50.6	91	39.5	115	42.4
20	43.1	44	43.4	68	43.3	92	40.7	116	42.6
21	42.4	45	46.0	69	42.8	93	42.8	117	55.7
22	40.9	46	44.6	70	47.8	94	62.1	118	42.1
23	42.5	47	46.0	71	45.3	95	42.7	119	40.6
24	48.9	48	49.6	72	48.4	96	40.6	120	43.8

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		20/05/94							
Time		5:00 am - 5:10 am							
Survey Point		N1							
Name of Surveyor		Jose Ernesto Zeledon Rivera.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	56.4	25	55.4	49	79.4	73	65.6	97	70.2
2	55.6	26	53.6	50	70.5	74	75.9	98	56.9
3	56.3	27	56.9	51	69.8	75	67.5	99	57.0
4	52.5	28	68.6	52	66.3	76	59.6	100	61.1
5	48.6	29	57.0	53	59.6	77	62.8	101	67.3
6	51.7	30	52.9	54	57.2	78	52.8	102	72.7
7	43.8	31	54.1	55	57.3	79	52.0	103	66.7
8	48.6	32	53.6	56	59.5	80	50.8	104	59.1
9	48.9	33	53.4	57	55.0	81	49.8	105	56.6
10	48.4	34	57.8	58	52.0	82	54.9	106	56.7
11	51.2	35	53.4	59	51.9	83	50.0	107	56.0
12	50.5	36	51.9	60	52.0	84	47.3	108	57.1
13	56.8	37	48.0	61	57.6	85	47.6	109	65.5
14	44.0	38	46.7	62	68.9	86	50.3	110	59.7
15	43.9	39	49.4	63	57.7	87	55.9	111	51.2
16	47.5	40	61.8	64	54.0	88	56.6	112	49.0
17	50.0	41	46.5	65	56.9	89	61.9	113	51.5
18	48.7	42	51.3	66	55.9	90	54.6	114	52.7
19	54.2	43	59.3	67	56.9	91	56.1	115	49.3
20	54.7	44	47.3	68	57.3	92	59.0	116	57.3
21	62.2	45	53.8	69	64.0	93	68.6	117	54.1
22	62.3	46	55.0	70	57.1	94	81.2	118	60.1
23	55.0	47	56.3	71	57.3	95	72.3	119	69.1
24	58.3	48	63.4	72	69.3	96	71.5	120	62.9

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		: 20/05/94							
Time		: 6:00 am - 6:10 am							
Survey Point		: N1							
Name of Surveyor		: Jose Ernesto Zeledon Rivera.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	48.9	25	59.4	49	66.1	73	65.8	97	60.1
2	56.3	26	53.0	50	71.2	74	69.0	98	64.0
3	56.7	27	59.7	51	64.1	75	64.1	99	65.8
4	68.4	28	50.4	52	65.6	76	64.7	100	65.6
5	66.1	29	49.0	53	64.1	77	77.4	101	64.7
6	47.8	30	50.7	54	61.4	78	67.1	102	58.6
7	50.1	31	55.2	55	69.7	79	62.2	103	55.3
8	48.5	32	52.5	56	84.0	80	66.2	104	54.4
9	49.1	33	63.9	57	76.8	81	73.6	105	58.0
10	51.6	34	66.5	58	71.9	82	75.8	106	53.3
11	57.2	35	55.3	59	72.6	83	76.1	107	50.4
12	75.4	36	57.4	60	68.4	84	62.4	108	52.8
13	61.5	37	56.3	61	64.9	85	61.5	109	58.4
14	53.3	38	71.4	62	63.0	86	65.1	110	70.9
15	55.8	39	67.4	63	59.5	87	60.6	111	69.1
16	56.8	40	73.8	64	58.8	88	56.8	112	61.8
17	63.9	41	66.4	65	58.3	89	56.8	113	58.2
18	72.9	42	58.1	66	59.8	90	56.7	114	64.8
19	67.9	43	55.7	67	58.0	91	60.2	115	64.5
20	64.0	44	52.7	68	59.8	92	61.7	116	55.2
21	59.4	45	53.4	69	67.4	93	69.3	117	55.4
22	62.9	46	61.0	70	63.2	94	73.9	118	55.5
23	65.4	47	60.0	71	61.3	95	62.6	119	59.1
24	58.2	48	64.5	72	68.1	96	59.3	120	63.1

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 20/05/94									
Time : 7:00am - 7:10am									
Survey Point : N1									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	74.1	25	72.7	49	63.4	73	60.3	97	64.9
2	62.6	26	68.5	50	71.7	74	61.4	98	63.2
3	74.8	27	71.6	51	73.1	75	67.6	99	72.5
4	64.1	28	66.8	52	69.0	76	72.7	100	74.1
5	57.4	29	69.5	53	71.5	77	78.7	101	78.3
6	63.9	30	62.3	54	77.6	78	72.5	102	69.3
7	72.2	31	74.9	55	81.9	79	69.8	103	75.6
8	62.3	32	75.1	56	67.2	80	72.9	104	71.7
9	67.8	33	64.4	57	63.0	81	68.3	105	68.3
10	72.7	34	78.3	58	64.9	82	64.0	106	65.2
11	62.1	35	71.0	59	63.5	83	69.0	107	66.5
12	66.8	36	66.4	60	68.6	84	73.1	108	76.6
13	76.2	37	73.7	61	62.8	85	68.0	109	66.1
14	68.6	38	58.2	62	57.5	86	65.1	110	70.7
15	70.6	39	58.7	63	56.4	87	74.8	111	63.4
16	65.5	40	60.0	64	61.1	88	68.8	112	62.9
17	66.8	41	55.0	65	75.7	89	63.1	113	71.2
18	69.1	42	72.9	66	77.2	90	65.2	114	73.1
19	66.0	43	63.6	67	60.2	91	60.9	115	70.1
20	69.4	44	57.2	68	60.9	92	58.8	116	69.0
21	70.1	45	70.1	69	61.4	93	58.2	117	65.7
22	74.8	46	59.2	70	59.9	94	68.6	118	63.4
23	72.8	47	72.0	71	61.4	95	73.8	119	70.0
24	74.1	48	65.9	72	75.2	96	62.2	120	87.1

UNIVERSIDAD NACIONAL DE INGENIERIA

PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

ESTUDIOS DE CALIDAD AMBIENTAL

- ESTUDIO DE RUIDOS EN EL PUNTO N2.

Coordinador del Equipo UNI :

Ing. Juan Manuel Muñoz Muñiz

Participantes :

- José Ernesto Zeledón**
- Mauricio Pavón**

Managua, 9 de Junio de 1994

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 8:00am - 8:10am									
Survey Point : N2									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	46.5	25	53.0	49	45.9	73	56.5	97	39.2
2	41.7	26	47.9	50	46.3	74	52.8	98	37.2
3	47.3	27	43.3	51	49.3	75	49.7	99	39.1
4	46.0	28	51.3	52	40.5	76	44.0	100	38.6
5	44.5	29	56.0	53	44.6	77	48.1	101	46.8
6	47.0	30	49.1	54	39.4	78	58.8	102	40.8
7	46.5	31	58.4	55	42.8	79	44.7	103	40.7
8	54.6	32	61.2	56	46.9	80	44.8	104	44.4
9	54.0	33	58.6	57	44.9	81	46.2	105	39.4
10	63.2	34	55.3	58	51.5	82	43.4	106	40.1
11	55.9	35	54.0	59	42.4	83	47.7	107	40.5
12	47.4	36	46.9	60	43.3	84	40.7	108	46.3
13	50.5	37	54.6	61	40.2	85	41.8	109	47.0
14	60.3	38	54.5	62	41.5	86	40.9	110	42.6
15	46.7	39	51.3	63	39.5	87	38.5	111	42.7
16	47.3	40	56.2	64	48.2	88	38.1	112	42.6
17	59.9	41	59.6	65	43.2	89	39.4	113	46.2
18	52.4	42	58.7	66	54.1	90	44.9	114	45.1
19	42.8	43	59.3	67	39.0	91	43.2	115	43.9
20	48.5	44	38.2	68	40.2	92	42.1	116	42.6
21	65.2	45	42.3	69	44.8	93	44.0	117	41.9
22	45.9	46	38.5	70	38.1	94	42.1	118	43.0
23	46.1	47	54.2	71	38.5	95	45.5	119	37.1
24	70.3	48	51.7	72	43.3	96	41.6	120	41.1

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 9:00am - 9:10am									
Survey Point : N2									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	39.6	25	40.6	49	46.8	73	38.4	97	39.4
2	41.8	26	37.0	50	40.2	74	37.7	98	40.8
3	37.1	27	40.5	51	39.1	75	44.1	99	36.0
4	40.8	28	37.4	52	37.1	76	45.4	100	36.9
5	39.6	29	37.0	53	41.9	77	39.0	101	39.3
6	44.0	30	38.2	54	40.2	78	37.8	102	36.8
7	38.6	31	40.1	55	40.0	79	39.6	103	35.2
8	41.3	32	37.8	56	44.0	80	38.4	104	37.0
9	39.2	33	36.7	57	43.8	81	38.0	105	40.5
10	41.2	34	39.6	58	44.3	82	38.1	106	39.3
11	39.4	35	37.7	59	50.3	83	34.9	107	38.2
12	39.7	36	42.4	60	53.8	84	39.9	108	44.6
13	39.9	37	38.7	61	58.2	85	35.6	109	36.0
14	67.7	38	39.9	62	57.1	86	37.3	110	37.6
15	38.5	39	38.0	63	67.8	87	37.2	111	37.5
16	38.6	40	38.2	64	46.3	88	46.1	112	38.5
17	38.9	41	39.3	65	49.0	89	36.1	113	42.8
18	38.4	42	38.1	66	42.2	90	39.0	114	45.1
19	41.3	43	37.1	67	40.7	91	34.0	115	59.8
20	41.7	44	43.5	68	40.2	92	37.4	116	39.4
21	39.4	45	39.0	69	40.1	93	46.8	117	43.3
22	38.5	46	37.9	70	39.8	94	40.3	118	42.2
23	41.0	47	35.9	71	42.5	95	42.0	119	38.3
24	49.8	48	38.6	72	40.1	96	40.9	120	47.5

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 10:00am - 10:10am									
Survey Point : N2									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	36.4	25	38.0	49	40.9	73	38.3	97	39.2
2	38.8	26	39.4	50	38.4	74	36.3	98	38.9
3	37.2	27	36.4	51	43.2	75	35.4	99	39.6
4	37.2	28	36.5	52	37.1	76	37.9	100	39.5
5	40.0	29	40.1	53	41.3	77	38.1	101	40.8
6	40.2	30	37.5	54	39.8	78	36.0	102	40.3
7	50.8	31	35.9	55	38.2	79	36.9	103	42.5
8	38.7	32	35.9	56	38.6	80	37.1	104	41.5
9	37.4	33	47.0	57	39.5	81	45.2	105	40.0
10	36.2	34	40.4	58	38.3	82	40.9	106	44.2
11	39.4	35	38.8	59	39.0	83	36.8	107	44.6
12	36.0	36	37.9	60	38.6	84	36.1	108	49.8
13	40.7	37	38.4	61	39.2	85	36.7	109	46.3
14	30.7	38	37.8	62	39.4	86	38.6	110	49.7
15	40.2	39	37.6	63	41.0	87	38.4	111	50.1
16	38.1	40	37.7	64	37.8	88	35.9	112	49.4
17	36.8	41	39.8	65	36.4	89	35.9	113	51.0
18	38.9	42	36.5	66	39.7	90	36.2	114	47.9
19	40.2	43	36.2	67	38.8	91	34.8	115	45.8
20	39.0	44	37.9	68	35.2	92	36.0	116	45.2
21	39.7	45	39.3	69	35.7	93	38.6	117	42.2
22	43.7	46	37.6	70	35.4	94	37.6	118	40.6
23	38.2	47	38.1	71	39.0	95	39.0	119	39.3
24	39.1	48	39.3	72	37.9	96	40.6	120	40.3

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 11:00am - 11:10am									
Survey Point : N2									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	39.3	25	43.2	49	48.7	73	58.3	97	41.6
2	40.1	26	46.1	50	38.5	74	54.5	98	42.0
3	43.8	27	49.2	51	38.7	75	55.5	99	48.7
4	44.0	28	41.3	52	39.1	76	43.7	100	44.0
5	45.0	29	38.3	53	40.3	77	40.2	101	45.1
6	47.6	30	41.2	54	41.6	78	47.6	102	42.0
7	42.0	31	53.7	55	41.3	79	58.6	103	44.8
8	42.2	32	44.0	56	40.8	80	50.8	104	44.1
9	46.5	33	42.4	57	45.5	81	40.6	105	42.8
10	48.6	34	46.2	58	45.0	82	46.4	106	46.1
11	42.5	35	44.1	59	44.1	83	48.5	107	39.3
12	40.7	36	42.0	60	42.2	84	39.9	108	44.8
13	38.3	37	40.2	61	39.2	85	42.1	109	45.8
14	40.9	38	47.6	62	45.3	86	39.2	110	44.6
15	40.5	39	42.2	63	39.0	87	39.6	111	42.3
16	51.3	40	44.6	64	39.8	88	38.7	112	40.2
17	49.3	41	40.8	65	40.0	89	41.2	113	40.2
18	56.7	42	42.9	66	39.5	90	46.2	114	40.2
19	53.4	43	42.3	67	49.2	91	45.1	115	42.7
20	53.4	44	48.0	68	44.8	92	56.7	116	43.0
21	53.0	45	44.0	69	48.7	93	48.0	117	43.5
22	49.6	46	39.7	70	42.8	94	44.3	118	45.8
23	39.8	47	41.2	71	47.3	95	53.6	119	43.0
24	44.3	48	43.9	72	43.5	96	42.3	120	42.5

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 12:00 m - 12:10 pm									
Survey Point : N2									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	44.2	25	44.7	49	45.9	73	42.1	97	54.7
2	38.8	26	46.6	50	39.3	74	43.1	98	41.2
3	40.9	27	42.8	51	40.6	75	50.6	99	45.6
4	39.8	28	41.8	52	54.4	76	47.1	100	42.2
5	39.3	29	41.1	53	39.9	77	47.5	101	40.0
6	40.9	30	40.8	54	40.1	78	46.2	102	41.7
7	40.4	31	40.6	55	39.7	79	46.7	103	40.0
8	46.0	32	45.3	56	41.3	80	47.5	104	41.8
9	40.9	33	44.4	57	44.7	81	48.4	105	39.8
10	40.2	34	44.4	58	47.7	82	47.1	106	40.7
11	41.2	35	44.0	59	47.2	83	46.6	107	42.4
12	40.3	36	50.2	60	50.2	84	55.1	108	42.9
13	39.8	37	42.5	61	53.4	85	48.3	109	41.0
14	38.9	38	39.0	62	42.6	86	45.3	110	39.8
15	42.0	39	37.3	63	43.3	87	41.7	111	40.4
16	44.2	40	45.8	64	42.7	88	43.4	112	39.7
17	51.4	41	47.1	65	53.1	89	37.8	113	41.0
18	45.4	42	42.9	66	43.6	90	41.8	114	40.7
19	42.9	43	46.7	67	42.7	91	49.2	115	42.1
20	41.9	44	44.4	68	56.1	92	46.0	116	42.6
21	50.1	45	44.0	69	48.2	93	40.1	117	47.8
22	52.5	46	43.9	70	44.3	94	40.2	118	47.0
23	43.7	47	39.7	71	46.8	95	45.9	119	40.4
24	44.0	48	44.1	72	44.3	96	52.0	120	39.4

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 1:00 pm - 1:10 pm									
Survey Point : N2									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	41.6	25	42.3	49	52.4	73	38.8	97	42.6
2	36.2	26	40.7	50	42.1	74	38.7	98	38.7
3	38.5	27	41.9	51	40.3	75	37.9	99	38.6
4	37.7	28	40.9	52	40.0	76	40.3	100	40.1
5	40.2	29	42.5	53	43.4	77	40.1	101	43.5
6	42.9	30	41.6	54	39.0	78	41.1	102	39.5
7	44.8	31	38.4	55	40.5	79	43.8	103	39.7
8	41.9	32	39.2	56	38.5	80	39.9	104	42.9
9	40.7	33	38.5	57	40.1	81	43.0	105	42.8
10	39.4	34	37.9	58	38.5	82	44.0	106	43.7
11	41.3	35	41.8	59	38.1	83	43.0	107	43.4
12	63.1	36	42.1	60	47.6	84	50.6	108	39.8
13	43.2	37	38.4	61	40.4	85	42.6	109	44.0
14	42.3	38	39.6	62	38.8	86	44.5	110	45.5
15	45.0	39	43.9	63	40.1	87	44.4	111	46.1
16	41.2	40	40.6	64	36.0	88	42.4	112	46.1
17	40.2	41	42.3	65	39.8	89	41.4	113	44.0
18	40.6	42	40.8	66	39.3	90	42.1	114	47.4
19	40.3	43	38.0	67	38.6	91	41.1	115	39.1
20	37.9	44	42.1	68	38.5	92	39.3	116	53.2
21	38.6	45	41.2	69	39.9	93	38.6	117	43.9
22	38.9	46	41.0	70	37.2	94	38.4	118	42.3
23	36.9	47	42.9	71	42.8	95	40.1	119	46.3
24	39.2	48	50.6	72	41.4	96	44.5	120	37.7

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 2:00 pm - 2:10 pm									
Survey Point : N2									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	39.7	25	39.4	49	44.9	73	43.1	97	44.2
2	35.6	26	44.3	50	42.4	74	41.7	98	41.4
3	35.8	27	43.7	51	42.5	75	45.0	99	40.9
4	37.9	28	43.8	52	44.8	76	41.4	100	39.7
5	38.3	29	39.4	53	42.1	77	44.6	101	37.9
6	38.2	30	43.2	54	42.9	78	45.3	102	42.6
7	39.1	31	42.5	55	42.2	79	42.8	103	43.4
8	40.0	32	43.9	56	42.4	80	44.3	104	42.8
9	42.7	33	41.4	57	43.9	81	45.3	105	48.9
10	42.8	34	41.8	58	41.1	82	40.4	106	43.5
11	45.3	35	39.2	59	42.7	83	40.5	107	43.6
12	44.0	36	42.6	60	44.5	84	40.2	108	46.1
13	44.8	37	42.5	61	42.2	85	44.6	109	42.2
14	39.2	38	41.4	62	45.3	86	45.2	110	39.5
15	37.3	39	41.8	63	41.1	87	39.9	111	39.5
16	46.5	40	38.3	64	46.1	88	40.3	112	39.5
17	43.7	41	40.3	65	44.0	89	43.2	113	39.9
18	43.6	42	39.8	66	44.0	90	43.8	114	36.9
19	41.0	43	40.8	67	41.0	91	41.7	115	44.0
20	45.8	44	39.0	68	44.8	92	42.1	116	57.1
21	43.1	45	39.7	69	41.6	93	39.2	117	61.2
22	40.7	46	39.7	70	39.7	94	38.5	118	71.3
23	38.5	47	40.1	71	42.5	95	38.6	119	58.5
24	38.2	48	40.6	72	44.0	96	41.9	120	43.6

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		: 23/05/94							
Time		: 3:00 pm - 3:10 pm							
Survey Point		: N2							
Name of Surveyor		: Jose Ernesto Zeledon Rivera.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	44.6	25	57.1	49	44.9	73	64.6	97	45.7
2	44.7	26	47.2	50	42.3	74	47.4	98	46.4
3	52.9	27	44.5	51	42.3	75	43.5	99	43.0
4	54.0	28	47.4	52	42.0	76	43.2	100	45.7
5	54.7	29	44.5	53	41.4	77	43.2	101	44.6
6	60.0	30	47.3	54	41.1	78	41.7	102	43.7
7	52.1	31	49.6	55	39.9	79	41.8	103	46.2
8	51.1	32	46.2	56	42.6	80	42.5	104	45.0
9	54.5	33	44.5	57	51.3	81	45.0	105	44.0
10	47.1	34	46.4	58	46.6	82	44.1	106	46.6
11	49.8	35	45.0	59	44.8	83	45.6	107	46.4
12	44.4	36	46.0	60	44.0	84	43.3	108	45.8
13	45.2	37	49.2	61	46.8	85	43.5	109	48.4
14	48.3	38	50.7	62	44.8	86	41.2	110	45.9
15	49.6	39	61.4	63	47.1	87	42.8	111	47.7
16	51.6	40	42.3	64	43.3	88	49.7	112	56.4
17	51.1	41	41.8	65	43.5	89	49.4	113	52.2
18	45.4	42	41.5	66	42.5	90	48.0	114	49.4
19	49.3	43	42.6	67	44.8	91	43.2	115	50.0
20	48.4	44	40.1	68	48.2	92	45.0	116	45.5
21	46.4	45	46.5	69	62.4	93	47.2	117	44.3
22	47.0	46	39.5	70	49.0	94	45.7	118	44.0
23	53.3	47	50.5	71	57.8	95	49.4	119	45.7
24	46.2	48	45.7	72	54.4	96	43.9	120	41.4

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 4:00 pm - 4:10 pm									
Survey Point : N2									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	40.9	25	41.3	49	53.4	73	48.8	97	45.6
2	53.0	26	42.8	50	44.3	74	56.4	98	51.7
3	51.2	27	41.8	51	56.6	75	42.5	99	48.1
4	39.8	28	39.6	52	39.1	76	40.1	100	43.6
5	43.8	29	41.3	53	37.7	77	38.8	101	52.2
6	44.4	30	42.6	54	38.5	78	45.0	102	41.7
7	41.9	31	44.9	55	38.3	79	38.7	103	44.4
8	41.5	32	40.4	56	38.7	80	39.0	104	41.1
9	41.5	33	42.1	57	38.0	81	39.6	105	42.2
10	41.8	34	41.1	58	39.6	82	38.4	106	51.5
11	42.6	35	45.3	59	39.8	83	39.8	107	47.6
12	42.7	36	39.7	60	39.0	84	43.2	108	40.9
13	46.2	37	48.0	61	39.8	85	41.4	109	41.3
14	40.8	38	45.2	62	37.3	86	39.9	110	51.8
15	40.5	39	41.2	63	39.4	87	38.9	111	43.8
16	43.8	40	44.2	64	38.9	88	38.0	112	40.6
17	42.0	41	47.3	65	39.7	89	41.8	113	39.1
18	42.5	42	43.2	66	38.7	90	39.4	114	41.0
19	40.1	43	46.0	67	40.2	91	44.4	115	40.7
20	41.0	44	50.5	68	38.5	92	42.1	116	41.7
21	39.2	45	53.9	69	41.1	93	53.9	117	41.3
22	40.7	46	45.9	70	56.2	94	52.1	118	39.9
23	42.4	47	41.9	71	46.6	95	49.8	119	40.2
24	39.8	48	38.9	72	43.4	96	42.2	120	38.9

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 5:00 pm - 5:10 pm									
Survey Point : N2									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	45.1	25	52.2	49	50.9	73	46.6	97	63.4
2	42.4	26	42.8	50	46.2	74	49.3	98	58.6
3	41.5	27	42.8	51	47.7	75	43.9	99	55.3
4	42.9	28	48.3	52	43.3	76	45.7	100	53.2
5	43.2	29	40.7	53	47.6	77	47.1	101	56.0
6	46.5	30	42.4	54	47.6	78	49.2	102	75.4
7	44.4	31	42.1	55	44.2	79	50.0	103	71.5
8	46.4	32	46.5	56	45.3	80	50.6	104	54.1
9	43.3	33	45.8	57	41.9	81	50.9	105	46.2
10	45.2	34	56.4	58	46.3	82	47.6	106	56.5
11	48.7	35	52.8	59	44.9	83	51.6	107	53.4
12	43.7	36	58.5	60	44.7	84	52.0	108	63.0
13	43.9	37	55.5	61	46.8	85	52.6	109	59.3
14	57.2	38	51.3	62	44.4	86	48.8	110	62.0
15	45.0	39	51.1	63	45.0	87	52.0	111	62.9
16	60.2	40	48.1	64	50.9	88	43.6	112	60.9
17	47.7	41	50.5	65	59.1	89	44.1	113	56.8
18	45.0	42	56.5	66	52.2	90	46.1	114	53.3
19	50.6	43	55.1	67	49.1	91	52.3	115	58.1
20	43.8	44	44.9	68	46.7	92	44.1	116	52.9
21	48.3	45	46.0	69	53.6	93	51.9	117	58.8
22	46.9	46	51.9	70	44.2	94	46.3	118	62.2
23	43.3	47	51.1	71	44.2	95	46.1	119	51.3
24	46.1	48	43.7	72	44.0	96	44.8	120	51.2

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 6:00 pm - 6:10 pm									
Survey Point : N2									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	45.1	25	49.6	49	45.4	73	51.8	97	45.3
2	61.9	26	45.5	50	47.6	74	50.5	98	54.3
3	56.3	27	51.2	51	45.4	75	50.1	99	54.9
4	48.1	28	46.3	52	46.3	76	52.5	100	48.0
5	49.8	29	46.0	53	43.8	77	57.4	101	45.3
6	48.5	30	44.4	54	42.1	78	60.9	102	47.5
7	50.0	31	43.7	55	42.8	79	62.3	103	44.5
8	49.6	32	44.1	56	42.8	80	57.6	104	53.2
9	46.9	33	46.2	57	45.2	81	56.3	105	45.8
10	45.9	34	48.3	58	43.5	82	53.6	106	46.2
11	44.0	35	46.5	59	46.8	83	53.5	107	45.1
12	44.4	36	47.2	60	42.8	84	51.2	108	44.5
13	42.6	37	44.1	61	45.5	85	49.8	109	44.7
14	41.5	38	43.7	62	48.3	86	54.9	110	45.6
15	43.0	39	45.3	63	46.1	87	55.3	111	43.6
16	45.5	40	43.8	64	44.2	88	49.7	112	45.3
17	50.2	41	42.7	65	48.1	89	47.9	113	43.3
18	50.9	42	43.2	66	47.1	90	55.8	114	44.3
19	47.8	43	43.1	67	57.5	91	51.4	115	44.4
20	50.8	44	43.5	68	47.8	92	51.2	116	46.7
21	48.3	45	46.3	69	47.8	93	55.8	117	44.1
22	45.6	46	41.5	70	51.7	94	56.2	118	45.7
23	45.3	47	43.3	71	53.7	95	48.7	119	50.7
24	49.2	48	44.9	72	54.5	96	47.2	120	48.4

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 7:00 pm - 7:10 pm									
Survey Point : N2									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	52.2	25	59.5	49	49.0	73	43.7	97	42.1
2	54.5	26	44.0	50	47.4	74	47.5	98	43.1
3	56.2	27	42.9	51	48.8	75	49.7	99	45.1
4	42.5	28	44.4	52	47.9	76	50.0	100	42.4
5	44.4	29	62.9	53	54.9	77	47.8	101	41.5
6	44.7	30	46.8	54	50.1	78	50.7	102	41.6
7	44.2	31	44.3	55	50.9	79	44.5	103	47.4
8	44.8	32	43.3	56	46.1	80	46.4	104	43.7
9	45.8	33	41.6	57	45.9	81	45.5	105	44.0
10	42.2	34	45.3	58	47.5	82	44.6	106	44.9
11	52.8	35	44.2	59	44.8	83	45.9	107	43.2
12	47.7	36	62.4	60	45.4	84	43.0	108	41.1
13	55.4	37	50.5	61	45.2	85	46.0	109	44.6
14	43.3	38	49.4	62	45.2	86	45.4	110	41.8
15	50.2	39	46.0	63	47.3	87	46.9	111	43.4
16	47.2	40	48.3	64	42.9	88	45.2	112	41.5
17	43.4	41	45.6	65	43.2	89	43.9	113	43.7
18	44.4	42	45.5	66	46.0	90	43.9	114	42.1
19	43.9	43	45.9	67	46.2	91	47.1	115	44.3
20	49.2	44	55.6	68	47.4	92	42.8	116	42.7
21	54.9	45	43.3	69	49.2	93	50.5	117	49.0
22	59.2	46	49.6	70	45.5	94	48.5	118	42.1
23	50.8	47	50.7	71	44.0	95	44.1	119	43.5
24	48.9	48	52.2	72	44.4	96	42.2	120	43.0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 8:00 pm - 8:10 pm									
Survey Point : N2									
Name of Surveyor : Jose Ernesto Zeledon Rivera.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	66.0	25	46.2	49	42.9	73	42.1	97	41.4
2	47.4	26	40.0	50	42.6	74	41.5	98	38.4
3	50.2	27	38.4	51	39.8	75	40.7	99	39.5
4	43.0	28	38.6	52	41.3	76	40.5	100	39.0
5	45.6	29	42.2	53	40.8	77	39.3	101	41.4
6	57.3	30	39.4	54	42.0	78	38.7	102	40.5
7	46.9	31	41.7	55	39.1	79	40.5	103	39.5
8	41.7	32	43.1	56	38.8	80	39.0	104	39.1
9	46.1	33	43.5	57	38.7	81	41.1	105	40.4
10	41.4	34	38.4	58	39.8	82	39.2	106	39.3
11	44.5	35	42.5	59	39.4	83	38.0	107	41.9
12	43.2	36	38.4	60	40.9	84	41.1	108	39.9
13	42.2	37	42.4	61	38.3	85	38.9	109	41.1
14	40.7	38	39.5	62	40.8	86	39.3	110	40.3
15	43.6	39	38.1	63	37.1	87	38.9	111	39.1
16	40.7	40	39.9	64	43.2	88	39.4	112	40.1
17	40.1	41	42.2	65	40.6	89	38.5	113	38.1
18	40.3	42	44.4	66	43.8	90	38.4	114	40.0
19	40.5	43	41.5	67	40.9	91	38.0	115	39.5
20	39.1	44	41.0	68	40.4	92	39.7	116	41.8
21	40.4	45	38.3	69	41.3	93	38.1	117	44.0
22	39.5	46	38.7	70	45.6	94	41.8	118	43.6
23	40.1	47	41.3	71	40.8	95	38.5	119	41.2
24	40.6	48	41.2	72	39.6	96	40.1	120	37.0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 9:00 pm - 9:10 pm									
Survey Point : N2									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	48.8	25	38.4	49	42.0	73	42.6	97	42.1
2	36.1	26	40.8	50	42.9	74	36.1	98	65.9
3	42.3	27	34.5	51	42.3	75	35.5	99	36.7
4	40.4	28	42.4	52	43.6	76	46.8	100	36.8
5	39.7	29	35.4	53	42.6	77	42.0	101	40.6
6	37.8	30	41.0	54	42.7	78	39.7	102	37.0
7	37.1	31	38.7	55	45.1	79	36.4	103	37.0
8	38.7	32	35.9	56	45.2	80	36.3	104	38.4
9	36.0	33	35.2	57	49.0	81	35.0	105	41.3
10	34.8	34	36.5	58	41.9	82	54.7	106	41.2
11	36.4	35	37.7	59	37.0	83	61.2	107	37.2
12	36.5	36	35.8	60	37.3	84	40.0	108	36.9
13	37.4	37	34.4	61	39.3	85	38.9	109	38.4
14	37.2	38	34.1	62	40.1	86	40.6	110	39.0
15	42.0	39	35.1	63	39.3	87	45.1	111	39.9
16	36.1	40	42.2	64	39.4	88	44.8	112	44.3
17	36.4	41	35.7	65	39.8	89	42.9	113	40.1
18	37.5	42	36.9	66	38.7	90	47.1	114	40.8
19	39.4	43	37.3	67	36.8	91	41.9	115	43.3
20	36.6	44	43.2	68	37.8	92	38.5	116	45.7
21	48.2	45	42.8	69	37.1	93	43.1	117	36.0
22	38.7	46	39.1	70	47.3	94	37.8	118	38.3
23	35.8	47	39.8	71	38.8	95	54.9	119	38.2
24	36.1	48	40.8	72	40.9	96	39.2	120	39.1

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 10:00 pm - 10:10 pm									
Survey Point : N2									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	49.9	25.0	40.4	49.0	35.5	73.0	67.7	97.0	50.8
2	44.9	26.0	38.4	50.0	42.0	74.0	49.0	98.0	50.7
3	54.6	27.0	36.2	51.0	40.1	75.0	36.5	99.0	43.3
4	53.6	28.0	39.3	52.0	36.8	76.0	37.0	100.0	42.5
5	35.3	29.0	35.9	53.0	37.9	77.0	37.7	101.0	38.8
6	37.1	30.0	37.8	54.0	36.5	78.0	38.0	102.0	40.7
7	39.5	31.0	36.3	55.0	37.4	79.0	39.7	103.0	43.4
8	34.8	32.0	36.8	56.0	45.4	80.0	36.1	104.0	40.4
9	36.6	33.0	41.0	57.0	35.8	81.0	38.3	105.0	42.0
10	38.3	34.0	40.0	58.0	35.1	82.0	38.1	106.0	41.4
11	37.4	35.0	48.0	59.0	37.1	83.0	39.7	107.0	39.5
12	42.5	36.0	40.0	60.0	37.2	84.0	39.4	108.0	40.7
13	39.6	37.0	38.0	61.0	36.5	85.0	39.2	109.0	40.1
14	40.5	38.0	35.9	62.0	36.9	86.0	38.6	110.0	39.9
15	42.5	39.0	36.7	63.0	43.9	87.0	38.1	111.0	37.9
16	46.3	40.0	34.0	64.0	38.8	88.0	39.8	112.0	39.9
17	40.1	41.0	36.5	65.0	36.2	89.0	36.4	113.0	39.6
18	37.5	42.0	35.1	66.0	35.7	90.0	35.7	114.0	38.5
19	37.9	43.0	37.8	67.0	36.6	91.0	41.6	115.0	38.4
20	37.1	44.0	38.2	68.0	38.1	92.0	51.8	116.0	37.6
21	35.0	45.0	35.8	69.0	41.5	93.0	40.0	117.0	44.2
22	37.2	46.0	36.3	70.0	43.5	94.0	45.6	118.0	38.0
23	36.1	47.0	36.7	71.0	47.3	95.0	37.3	119.0	35.8
24	41.2	48.0	47.0	72.0	36.9	96.0	44.9	120.0	39.0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 11:00 pm - 11:10 pm									
Survey Point : N2									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	57.4	25.0	39.2	49.0	41.9	73.0	38.1	97.0	51.8
2	44.5	26.0	33.1	50.0	35.3	74.0	37.7	98.0	51.7
3	45.4	27.0	36.1	51.0	41.3	75.0	38.8	99.0	48.0
4	46.4	28.0	39.3	52.0	42.5	76.0	39.3	100.0	35.2
5	47.6	29.0	40.7	53.0	42.2	77.0	41.8	101.0	36.7
6	38.7	30.0	41.2	54.0	36.7	78.0	39.9	102.0	43.7
7	37.1	31.0	45.7	55.0	38.6	79.0	42.0	103.0	42.2
8	40.5	32.0	59.0	56.0	40.7	80.0	42.0	104.0	43.7
9	37.1	33.0	38.6	57.0	37.5	81.0	39.6	105.0	51.4
10	40.1	34.0	41.7	58.0	40.9	82.0	40.7	106.0	42.6
11	39.4	35.0	32.5	59.0	45.6	83.0	42.7	107.0	41.5
12	38.4	36.0	42.1	60.0	38.6	84.0	44.6	108.0	36.1
13	40.3	37.0	39.1	61.0	39.8	85.0	39.1	109.0	41.5
14	36.3	38.0	36.7	62.0	39.7	86.0	37.8	110.0	56.1
15	40.2	39.0	34.4	63.0	39.1	87.0	38.5	111.0	36.1
16	45.2	40.0	40.0	64.0	40.0	88.0	40.6	112.0	35.5
17	49.2	41.0	41.0	65.0	45.4	89.0	40.9	113.0	35.0
18	40.3	42.0	39.1	66.0	39.7	90.0	42.2	114.0	45.7
19	36.3	43.0	34.2	67.0	37.1	91.0	39.7	115.0	41.9
20	36.8	44.0	38.0	68.0	36.5	92.0	37.9	116.0	39.3
21	37.2	45.0	39.1	69.0	36.3	93.0	39.4	117.0	44.5
22	39.2	46.0	42.0	70.0	37.8	94.0	37.4	118.0	40.8
23	36.3	47.0	41.0	71.0	38.0	95.0	35.9	119.0	44.4
24	52.9	48.0	36.7	72.0	37.9	96.0	37.4	120.0	52.8

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 23/05/94									
Time : 12:00 pm - 12:10 am									
Survey Point : N2									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	67.1	25.0	40.8	49.0	39.6	73.0	39.1	97.0	47.4
2	49.7	26.0	40.5	50.0	36.2	74.0	39.8	98.0	57.1
3	53.8	27.0	40.4	51.0	42.6	75.0	38.8	99.0	37.1
4	44.9	28.0	39.2	52.0	40.7	76.0	40.0	100.0	39.1
5	38.9	29.0	40.1	53.0	37.5	77.0	39.3	101.0	64.2
6	37.2	30.0	40.2	54.0	39.7	78.0	36.0	102.0	59.9
7	40.2	31.0	38.1	55.0	36.1	79.0	37.0	103.0	43.4
8	38.2	32.0	39.9	56.0	35.6	80.0	36.9	104.0	39.1
9	38.5	33.0	36.0	57.0	36.3	81.0	42.7	105.0	50.1
10	40.2	34.0	37.7	58.0	40.5	82.0	39.1	106.0	39.8
11	43.7	35.0	38.8	59.0	40.6	83.0	47.7	107.0	37.3
12	38.5	36.0	36.4	60.0	53.8	84.0	53.2	108.0	49.1
13	36.1	37.0	38.8	61.0	58.5	85.0	63.0	109.0	58.1
14	42.1	38.0	37.1	62.0	40.5	86.0	43.6	110.0	55.1
15	35.8	39.0	39.9	63.0	48.3	87.0	37.9	111.0	52.3
16	40.4	40.0	35.2	64.0	61.2	88.0	40.6	112.0	45.3
17	41.8	41.0	48.0	65.0	50.2	89.0	35.7	113.0	40.3
18	39.1	42.0	48.7	66.0	43.2	90.0	36.7	114.0	50.2
19	39.6	43.0	34.8	67.0	39.9	91.0	39.1	115.0	58.5
20	39.7	44.0	36.4	68.0	38.4	92.0	41.4	116.0	52.0
21	39.4	45.0	36.6	69.0	37.9	93.0	39.1	117.0	49.2
22	39.4	46.0	36.6	70.0	40.5	94.0	39.2	118.0	39.4
23	39.6	47.0	38.5	71.0	39.2	95.0	39.2	119.0	37.6
24	37.6	48.0	36.4	72.0	38.2	96.0	38.1	120.0	59.7

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 24/05/94									
Time : 1:00 am - 1:10 am									
Survey Point : N2									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	57.1	25.0	40.8	49.0	39.7	73.0	46.0	97.0	44.9
2	46.5	26.0	50.2	50.0	49.2	74.0	61.1	98.0	49.2
3	48.7	27.0	55.2	51.0	48.4	75.0	43.8	99.0	46.0
4	50.1	28.0	54.3	52.0	48.7	76.0	47.8	100.0	42.8
5	45.0	29.0	50.7	53.0	46.2	77.0	41.6	101.0	54.3
6	45.5	30.0	45.5	54.0	44.6	78.0	50.6	102.0	42.4
7	40.8	31.0	46.8	55.0	47.9	79.0	38.3	103.0	45.0
8	48.0	32.0	55.6	56.0	47.0	80.0	42.3	104.0	40.2
9	45.0	33.0	62.8	57.0	50.8	81.0	37.7	105.0	48.6
10	46.3	34.0	72.8	58.0	43.4	82.0	43.8	106.0	55.1
11	60.2	35.0	56.5	59.0	49.3	83.0	42.7	107.0	53.2
12	44.5	36.0	45.9	60.0	59.0	84.0	48.5	108.0	36.0
13	40.5	37.0	50.8	61.0	47.2	85.0	47.1	109.0	39.1
14	46.8	38.0	36.7	62.0	46.3	86.0	43.2	110.0	41.7
15	47.3	39.0	39.4	63.0	41.8	87.0	46.3	111.0	44.0
16	38.6	40.0	46.6	64.0	40.4	88.0	41.1	112.0	47.1
17	42.3	41.0	50.3	65.0	36.4	89.0	59.8	113.0	50.1
18	40.0	42.0	46.3	66.0	42.1	90.0	45.1	114.0	43.0
19	37.2	43.0	46.5	67.0	42.1	91.0	48.3	115.0	45.1
20	58.1	44.0	53.5	68.0	44.5	92.0	41.6	116.0	44.2
21	40.9	45.0	45.2	69.0	44.7	93.0	47.9	117.0	41.6
22	45.8	46.0	49.2	70.0	52.1	94.0	49.1	118.0	41.5
23	44.8	47.0	42.1	71.0	39.8	95.0	55.2	119.0	38.6
24	47.0	48.0	40.5	72.0	44.4	96.0	48.2	120.0	41.3

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 24/05/94									
Time : 2:00 am - 2:10 am									
Survey Point : N2									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	46.7	25.0	39.3	49.0	35.4	73.0	36.0	97.0	48.4
2	50.8	26.0	56.4	50.0	37.6	74.0	38.1	98.0	39.4
3	42.0	27.0	40.5	51.0	40.0	75.0	35.5	99.0	37.2
4	53.2	28.0	51.0	52.0	38.1	76.0	37.2	100.0	34.4
5	34.8	29.0	38.1	53.0	39.1	77.0	34.8	101.0	33.5
6	47.0	30.0	35.9	54.0	38.3	78.0	34.4	102.0	34.6
7	38.2	31.0	37.6	55.0	40.1	79.0	35.7	103.0	35.9
8	44.4	32.0	39.2	56.0	38.1	80.0	36.1	104.0	35.4
9	39.6	33.0	36.4	57.0	34.4	81.0	50.4	105.0	36.6
10	39.1	34.0	53.6	58.0	38.4	82.0	41.7	106.0	38.5
11	41.8	35.0	38.0	59.0	41.6	83.0	38.2	107.0	42.5
12	46.6	36.0	38.8	60.0	39.9	84.0	39.9	108.0	37.1
13	35.8	37.0	39.8	61.0	35.8	85.0	40.0	109.0	35.3
14	42.5	38.0	39.2	62.0	39.6	86.0	33.8	110.0	36.2
15	36.9	39.0	37.7	63.0	38.4	87.0	37.0	111.0	38.5
16	39.1	40.0	40.1	64.0	43.0	88.0	41.0	112.0	36.6
17	35.7	41.0	42.2	65.0	38.1	89.0	37.1	113.0	35.8
18	36.5	42.0	41.4	66.0	48.9	90.0	34.5	114.0	36.7
19	38.3	43.0	56.8	67.0	37.2	91.0	37.0	115.0	38.7
20	41.9	44.0	36.2	68.0	36.4	92.0	35.4	116.0	35.9
21	35.3	45.0	38.9	69.0	46.8	93.0	40.6	117.0	34.7
22	39.5	46.0	38.9	70.0	35.1	94.0	38.6	118.0	38.9
23	46.1	47.0	38.8	71.0	34.4	95.0	39.1	119.0	36.5
24	41.1	48.0	38.5	72.0	35.0	96.0	34.2	120.0	36.3

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 24/05/94									
Time : 3:00 am - 3:10 am									
Survey Point : N2									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	47.9	25.0	44.2	49.0	34.3	73.0	51.1	97.0	48.3
2	48.6	26.0	35.2	50.0	35.9	74.0	39.3	98.0	43.6
3	40.4	27.0	39.7	51.0	39.4	75.0	36.9	99.0	36.7
4	38.4	28.0	33.8	52.0	37.7	76.0	37.2	100.0	39.2
5	41.3	29.0	33.0	53.0	37.8	77.0	43.1	101.0	40.0
6	41.9	30.0	31.7	54.0	38.7	78.0	41.1	102.0	33.4
7	40.6	31.0	36.7	55.0	33.5	79.0	37.0	103.0	33.2
8	38.8	32.0	34.7	56.0	40.2	80.0	38.4	104.0	46.5
9	38.4	33.0	35.2	57.0	49.9	81.0	43.9	105.0	44.7
10	45.1	34.0	37.3	58.0	36.8	82.0	36.9	106.0	34.3
11	42.1	35.0	36.0	59.0	43.3	83.0	36.2	107.0	33.8
12	55.7	36.0	35.1	60.0	36.5	84.0	33.5	108.0	34.9
13	38.8	37.0	42.4	61.0	31.9	85.0	44.0	109.0	34.6
14	48.0	38.0	42.6	62.0	34.8	86.0	39.6	110.0	35.9
15	37.1	39.0	36.3	63.0	36.4	87.0	41.6	111.0	34.8
16	42.3	40.0	34.0	64.0	32.2	88.0	43.8	112.0	37.1
17	33.6	41.0	46.9	65.0	35.9	89.0	38.9	113.0	37.4
18	35.8	42.0	43.2	66.0	35.2	90.0	33.8	114.0	33.6
19	43.6	43.0	41.5	67.0	38.5	91.0	39.2	115.0	35.8
20	35.0	44.0	38.2	68.0	34.4	92.0	33.8	116.0	33.3
21	34.2	45.0	36.2	69.0	41.9	93.0	33.5	117.0	35.9
22	34.5	46.0	36.5	70.0	33.9	94.0	40.7	118.0	42.0
23	36.5	47.0	40.6	71.0	35.7	95.0	34.6	119.0	34.1
24	37.7	48.0	39.4	72.0	39.0	96.0	35.9	120.0	47.0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 24/05/94									
Time : 4:00 am - 4:10 am									
Survey Point : N2									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	48.0	25.0	38.6	49.0	38.1	73.0	53.5	97.0	54.9
2	39.9	26.0	58.9	50.0	38.9	74.0	40.7	98.0	39.5
3	40.3	27.0	41.6	51.0	48.7	75.0	42.6	99.0	42.2
4	38.6	28.0	41.8	52.0	58.1	76.0	45.2	100.0	38.3
5	45.8	29.0	65.0	53.0	37.8	77.0	41.8	101.0	48.2
6	36.4	30.0	51.8	54.0	43.4	78.0	41.4	102.0	65.5
7	40.7	31.0	38.8	55.0	48.2	79.0	39.4	103.0	44.4
8	43.8	32.0	39.3	56.0	42.3	80.0	37.7	104.0	39.1
9	40.9	33.0	39.9	57.0	47.7	81.0	51.6	105.0	35.1
10	51.9	34.0	57.8	58.0	39.3	82.0	47.8	106.0	36.4
11	39.1	35.0	47.0	59.0	36.0	83.0	41.1	107.0	45.5
12	53.4	36.0	41.0	60.0	40.9	84.0	48.5	108.0	39.0
13	64.8	37.0	42.2	61.0	49.4	85.0	40.6	109.0	53.2
14	40.1	38.0	39.0	62.0	56.2	86.0	45.6	110.0	39.1
15	68.2	39.0	79.8	63.0	37.7	87.0	40.6	111.0	37.9
16	38.2	40.0	44.0	64.0	47.1	88.0	46.2	112.0	62.3
17	39.4	41.0	44.6	65.0	41.8	89.0	48.1	113.0	35.3
18	39.1	42.0	46.9	66.0	35.0	90.0	46.6	114.0	38.0
19	42.6	43.0	37.8	67.0	39.2	91.0	45.2	115.0	41.5
20	43.0	44.0	43.7	68.0	59.0	92.0	46.7	116.0	41.4
21	41.0	45.0	49.0	69.0	39.3	93.0	37.8	117.0	53.1
22	39.9	46.0	38.1	70.0	48.2	94.0	68.1	118.0	44.2
23	46.6	47.0	34.2	71.0	41.6	95.0	52.4	119.0	55.9
24	44.4	48.0	37.8	72.0	39.9	96.0	36.7	120.0	47.0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 24/05/94									
Time : 5:00 am - 5:10 am									
Survey Point : N2									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	43.6	25.0	50.9	49.0	51.9	73.0	49.6	97.0	51.0
2	50.2	26.0	57.2	50.0	38.4	74.0	36.2	98.0	41.7
3	43.7	27.0	38.4	51.0	34.5	75.0	36.7	99.0	35.6
4	38.7	28.0	59.0	52.0	34.3	76.0	33.5	100.0	40.4
5	46.3	29.0	39.2	53.0	41.2	77.0	34.4	101.0	39.4
6	54.3	30.0	35.4	54.0	32.4	78.0	40.0	102.0	60.6
7	36.7	31.0	40.2	55.0	34.5	79.0	58.0	103.0	34.2
8	36.3	32.0	37.0	56.0	35.0	80.0	43.9	104.0	35.6
9	41.2	33.0	43.0	57.0	32.9	81.0	58.5	105.0	38.6
10	42.0	34.0	54.6	58.0	36.9	82.0	33.5	106.0	35.6
11	41.0	35.0	33.4	59.0	34.6	83.0	39.4	107.0	33.7
12	40.7	36.0	34.5	60.0	34.4	84.0	36.6	108.0	32.2
13	37.1	37.0	37.7	61.0	47.2	85.0	48.5	109.0	32.3
14	46.4	38.0	47.1	62.0	66.8	86.0	56.0	110.0	36.1
15	34.9	39.0	37.0	63.0	39.8	87.0	37.1	111.0	33.2
16	56.3	40.0	37.7	64.0	53.1	88.0	50.0	112.0	42.6
17	47.2	41.0	36.4	65.0	46.8	89.0	48.2	113.0	36.0
18	40.8	42.0	38.1	66.0	34.7	90.0	50.3	114.0	37.5
19	46.1	43.0	37.2	67.0	35.7	91.0	42.6	115.0	37.2
20	50.0	44.0	40.3	68.0	32.9	92.0	39.7	116.0	42.3
21	44.3	45.0	34.6	69.0	35.7	93.0	57.2	117.0	40.3
22	37.5	46.0	39.7	70.0	32.9	94.0	52.1	118.0	39.9
23	60.1	47.0	55.4	71.0	33.0	95.0	49.0	119.0	42.5
24	40.3	48.0	38.4	72.0	35.0	96.0	61.0	120.0	41.2

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date		: 24/05/94							
Time		: 6:00 am - 6:10 am							
Survey Point		: N2							
Name of Surveyor		: Mauricio R. Pavón M.							
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	59.0	25	36.1	49	38.4	73	47.7	97	39.5
2	57.8	26	52.2	50	40.4	74	48.5	98	49.5
3	37.2	27	46.0	51	43.9	75	39.2	99	48.7
4	38.8	28	52.8	52	39.0	76	40.5	100	49.6
5	49.1	29	36.7	53	36.8	77	37.8	101	38.8
6	47.0	30	40.0	54	36.4	78	41.5	102	50.7
7	43.1	31	39.9	55	41.5	79	36.2	103	36.7
8	39.6	32	37.7	56	45.7	80	55.1	104	49.0
9	52.1	33	39.1	57	45.9	81	39.5	105	41.8
10	36.6	34	38.4	58	53.4	82	37.0	106	35.0
11	45.6	35	38.0	59	39.5	83	52.5	107	67.5
12	65.9	36	40.3	60	39.1	84	48.8	108	35.5
13	56.1	37	37.4	61	42.9	85	39.6	109	53.7
14	47.1	38	36.7	62	38.9	86	39.3	110	47.4
15	35.2	39	38.1	63	36.7	87	38.9	111	42.0
16	43.6	40	36.6	64	35.6	88	36.8	112	35.8
17	35.1	41	40.3	65	39.8	89	51.0	113	43.0
18	40.6	42	35.4	66	54.5	90	52.6	114	37.8
19	44.4	43	49.8	67	39.9	91	38.0	115	55.1
20	57.1	44	51.3	68	45.8	92	36.5	116	40.3
21	36.0	45	36.8	69	35.8	93	44.9	117	53.4
22	40.5	46	35.8	70	38.5	94	42.6	118	41.0
23	37.2	47	42.0	71	40.6	95	45.8	119	39.1
24	38.2	48	36.2	72	34.8	96	50.3	120	36.7

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

Noise Level Survey

Date : 24/05/94									
Time : 7:00 am - 7:10 am									
Survey Point : N2									
Name of Surveyor : Mauricio R. Pavón M.									
No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)	No. of Date	Unit (dB)
1	40.1	25.0	48.7	49.0	42.4	73.0	43.3	97.0	39.3
2	37.1	26.0	36.9	50.0	41.5	74.0	41.3	98.0	37.4
3	41.5	27.0	38.9	51.0	41.8	75.0	46.6	99.0	43.8
4	40.5	28.0	44.7	52.0	43.0	76.0	44.3	100.0	47.8
5	36.2	29.0	40.6	53.0	34.5	77.0	36.6	101.0	41.5
6	36.6	30.0	41.5	54.0	49.3	78.0	36.1	102.0	51.4
7	43.1	31.0	36.8	55.0	37.3	79.0	39.1	103.0	34.7
8	40.4	32.0	47.7	56.0	38.3	80.0	37.4	104.0	37.5
9	42.1	33.0	37.0	57.0	46.0	81.0	37.2	105.0	47.6
10	56.4	34.0	36.1	58.0	39.4	82.0	39.8	106.0	35.2
11	41.2	35.0	36.9	59.0	42.2	83.0	60.0	107.0	42.6
12	37.4	36.0	38.2	60.0	40.6	84.0	38.3	108.0	47.7
13	39.8	37.0	36.4	61.0	37.8	85.0	48.8	109.0	45.5
14	35.4	38.0	37.7	62.0	37.9	86.0	40.1	110.0	38.6
15	41.1	39.0	48.1	63.0	53.1	87.0	38.0	111.0	41.7
16	41.5	40.0	47.1	64.0	41.7	88.0	38.3	112.0	40.5
17	39.8	41.0	35.1	65.0	46.5	89.0	62.0	113.0	48.2
18	38.8	42.0	36.5	66.0	50.8	90.0	39.1	114.0	39.7
19	38.9	43.0	36.7	67.0	50.4	91.0	43.9	115.0	44.8
20	39.9	44.0	61.0	68.0	41.1	92.0	47.3	116.0	42.7
21	37.4	45.0	52.1	69.0	42.5	93.0	48.3	117.0	42.2
22	47.5	46.0	40.7	70.0	35.3	94.0	39.3	118.0	40.1
23	38.5	47.0	36.8	71.0	36.8	95.0	37.7	119.0	38.3
24	41.9	48.0	36.8	72.0	42.4	96.0	37.3	120.0	41.4

UNIVERSIDAD NACIONAL DE INGENIERIA

PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

ESTUDIOS DE CALIDAD AMBIENTAL

- ESTUDIO DE VOLUMEN DE TRAFICO EN EL PUNTO T1.

Coordinador del Equipo UNI :

Ing. Juan Manuel Muñoz Muñiz

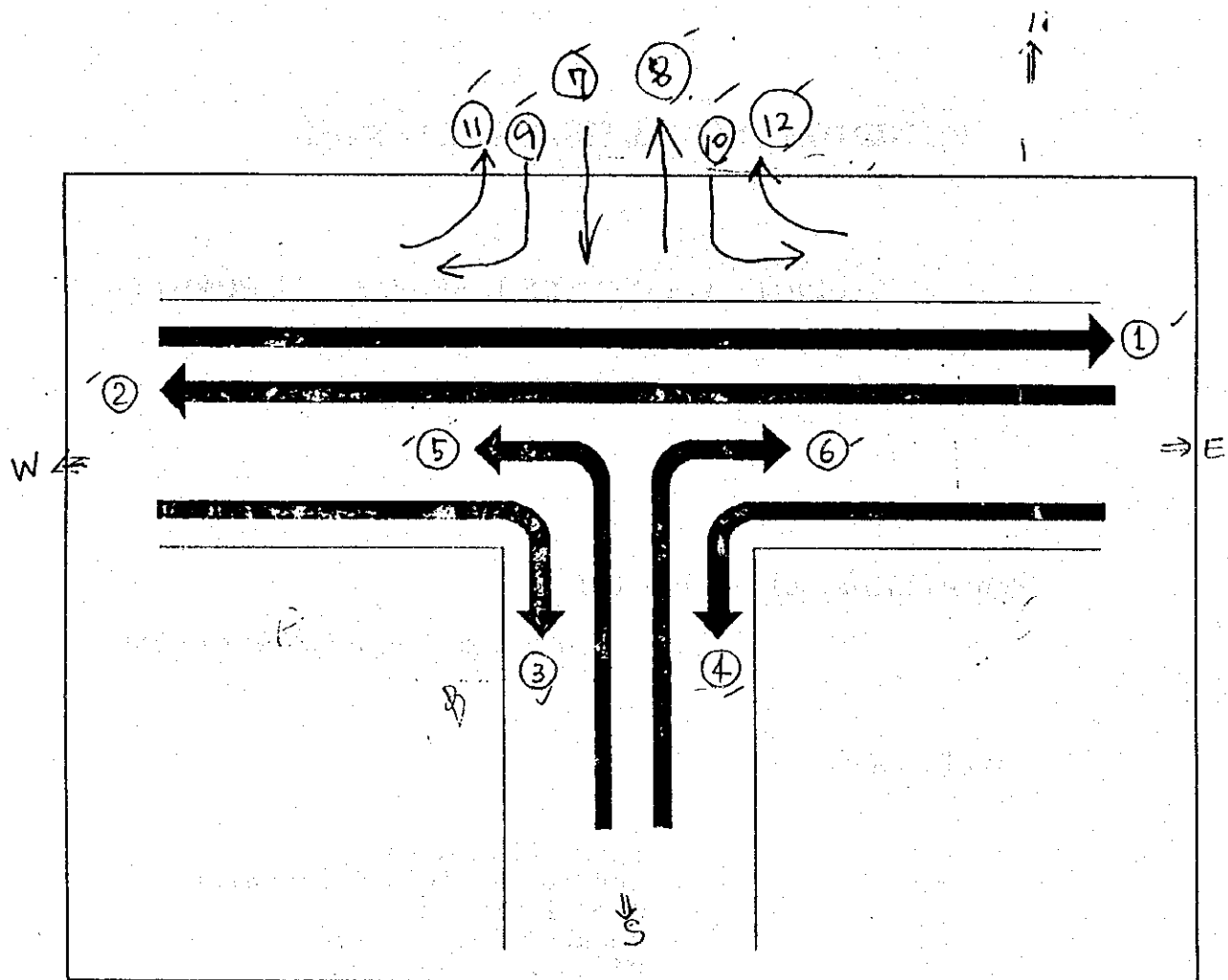
Participantes :

- María Elsa Mena
- Yadira Patricia Quintanilla
- Alberta Smith
- César Pérez Parrales
- Mirle Zeledón Rivera
- Alberto Lacayo
- Olga Narváes Miranda
- Adalberto Olivas Obregón

Managua, 9 de Junio de 1994

ALPHABETICALLY BY LOCATION

THESE ARE THE NAMES OF THE STATIONS AND THE ORDER IN WHICH THEY ARE VISITED



UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

SURVEY SHEET FOR TRAFFIC VOLUMES SURVEY

Date : 19/05/94				
Direction No.: 10 (N - E)				
Survey Point : T1				
Name of Surveyor : Maria Elsa Mena y Yadiria Patricia Quintanilla				

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle	Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
		Light Vehicle	Heavy Vehicle				Light Vehicle	Heavy Vehicle	
Hour	Minute				Hour	Minute			
1	0 - 10	0	0	0	13	0 - 10	0	2	0
	0 - 60	0	0	0		0 - 60	6	3	1
2	0 - 10	0	0	0	14	0 - 10	1	0	0
	0 - 60	0	0	0		0 - 60	3	2	0
3	0 - 10	0	0	0	15	0 - 10	0	0	0
	0 - 60	0	0	0		0 - 60	8	0	0
4	0 - 10	0	0	0	16	0 - 10	1	1	0
	0 - 60	0	0	0		0 - 60	6	1	0
5	0 - 10	0	0	0	17	0 - 10	0	0	0
	0 - 60	1	0	0		0 - 60	4	2	0
6	0 - 10	0	0	0	18	0 - 10	0	0	0
	0 - 60	1	0	0		0 - 60	4	1	0
7	0 - 10	0	1	1	19	0 - 10	1	0	0
	0 - 60	3	1	1		0 - 60	4	0	0
8	0 - 10	0	0	0	20	0 - 10	0	0	1
	0 - 60	6	2	0		0 - 60	1	0	1
9	0 - 10	1	0	0	21	0 - 10	1	0	0
	0 - 60	10	0	1		0 - 60	3	0	0
10	0 - 10	0	0	1	22	0 - 10	2	0	0
	0 - 60	7	1	5		0 - 60	2	0	0
11	0 - 10	1	0	0	23	0 - 10	0	0	0
	0 - 60	8	2	1		0 - 60	3	0	0
12	0 - 10	1	1	0	24	0 - 10	0	0	0
	0 - 60	6	3	2		0 - 60	1	0	0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

SURVEY SHEET FOR TRAFFIC VOLUMES SURVEY

Date : 19/05/94				
Direction No.: 9 (N - W)				
Survey Point : T1				
Name of Surveyor : María Elsa Mena y Yadira Patricia Quintanilla				

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
Hour	Minute	Light Vehicle	Heavy Vehicle	
1	0 - 10	1	0	0
	0 - 60	1	0	0
2	0 - 10	0	0	0
	0 - 60	0	0	0
3	0 - 10	0	0	0
	0 - 60	0	0	0
4	0 - 10	0	0	0
	0 - 60	1	0	0
5	0 - 10	0	0	0
	0 - 60	1	0	0
6	0 - 10	0	0	0
	0 - 60	0	0	0
7	0 - 10	1	0	0
	0 - 60	2	0	0
8	0 - 10	0	0	0
	0 - 60	3	2	0
9	0 - 10	2	0	0
	0 - 60	6	0	2
10	0 - 10	3	1	0
	0 - 60	3	4	1
11	0 - 10	0	0	0
	0 - 60	3	1	0
12	0 - 10	1	0	0
	0 - 60	5	0	0

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
Hour	Minute	Light Vehicle	Heavy Vehicle	
13	0 - 10	0	0	0
	0 - 60	1	0	0
14	0 - 10	2	0	0
	0 - 60	3	0	0
15	0 - 10	2	0	0
	0 - 60	3	0	0
16	0 - 10	1	0	0
	0 - 60	4	0	0
17	0 - 10	2	0	0
	0 - 60	7	2	0
18	0 - 10	1	0	0
	0 - 60	3	0	0
19	0 - 10	0	0	0
	0 - 60	1	0	0
20	0 - 10	0	0	0
	0 - 60	1	0	0
21	0 - 10	1	0	0
	0 - 60	3	0	0
22	0 - 10	0	0	0
	0 - 60	1	0	0
23	0 - 10	0	0	0
	0 - 60	0	0	0
24	0 - 10	0	0	0
	0 - 60	1	0	0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

SURVEY SHEET FOR TRAFFIC VOLUMES SURVEY

Date : 19/05/94				
Direction No.: 7 (N - S)				
Survey Point : T1				
Name of Surveyor: María Elsa Mena y Yadira Patricia Quintanilla				

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle	Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
		Light Vehicle	Heavy Vehicle				Light Vehicle	Heavy Vehicle	
1	0 - 10	0	0	0	13	0 - 10	3	1	2
	0 - 60	0	0	0		0 - 60	6	3	6
2	0 - 10	0	0	0	14	0 - 10	1	0	0
	0 - 60	0	0	0		0 - 60	2	1	2
3	0 - 10	0	0	0	15	0 - 10	0	0	0
	0 - 60	0	0	0		0 - 60	3	2	0
4	0 - 10	0	0	0	16	0 - 10	0	0	0
	0 - 60	0	1	0		0 - 60	2	0	0
5	0 - 10	0	0	0	17	0 - 10	0	0	0
	0 - 60	1	1	0		0 - 60	8	0	1
6	0 - 10	0	0	0	18	0 - 10	1	1	0
	0 - 60	3	1	0		0 - 60	2	2	0
7	0 - 10	0	0	1	19	0 - 10	0	0	0
	0 - 60	3	1	1		0 - 60	0	0	0
8	0 - 10	0	0	0	20	0 - 10	0	0	0
	0 - 60	6	1	1		0 - 60	1	0	0
9	0 - 10	2	0	0	21	0 - 10	0	0	0
	0 - 60	4	1	3		0 - 60	0	0	0
10	0 - 10	3	0	1	22	0 - 10	0	0	0
	0 - 60	3	4	11		0 - 60	1	0	0
11	0 - 10	2	0	3	23	0 - 10	0	0	0
	0 - 60	9	1	8		0 - 60	3	0	0
12	0 - 10	0	0	0	24	0 - 10	0	0	0
	0 - 60	2	3	10		0 - 60	0	0	0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

SURVEY SHEET FOR TRAFFIC VOLUMES SURVEY

Date		19/05/94		
Direction No.:		3 (W - S)		
Survey Point		T1		
Name of Surveyor:		Alberta Smith y César Pérez Parrales		

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle	Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
		Light Vehicle	Heavy Vehicle				Light Vehicle	Heavy Vehicle	
Hour	Minute				Hour	Minute			
1	0 - 10	1	0	0	13	0 - 10	3	0	0
	0 - 60	1	0	0		0 - 60	27	4	1
2	0 - 10	0	0	0	14	0 - 10	3	0	0
	0 - 60	0	0	0		0 - 60	17	1	2
3	0 - 10	0	0	0	15	0 - 10	7	0	1
	0 - 60	0	0	0		0 - 60	32	5	2
4	0 - 10	0	0	0	16	0 - 10	3	0	0
	0 - 60	2	1	0		0 - 60	31	2	0
5	0 - 10	0	0	0	17	0 - 10	9	0	0
	0 - 60	4	1	0		0 - 60	39	2	1
6	0 - 10	0	0	0	18	0 - 10	7	0	0
	0 - 60	5	1	0		0 - 60	22	0	0
7	0 - 10	2	0	0	19	0 - 10	3	0	0
	0 - 60	9	1	0		0 - 60	16	0	0
8	0 - 10	10	0	0	20	0 - 10	5	0	0
	0 - 60	23	4	0		0 - 60	12	0	0
9	0 - 10	6	2	0	21	0 - 10	3	0	0
	0 - 60	29	5	0		0 - 60	10	1	0
10	0 - 10	5	0	0	22	0 - 10	1	0	0
	0 - 60	45	0	3		0 - 60	4	0	0
11	0 - 10	5	0	0	23	0 - 10	1	0	0
	0 - 60	36	3	6		0 - 60	2	0	0
12	0 - 10	10	0	1	24	0 - 10	0	0	0
	0 - 60	39	0	2		0 - 60	0	0	0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

SURVEY SHEET FOR TRAFFIC VOLUMES SURVEY

Date : 19/05/94	
Direction No.: 1 (W - E)	
Survey Point : T1	
Name of Surveyor: Alberta Smith y César Pérez Parrales	

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
Hour	Minute	Light Vehicle	Heavy Vehicle	
1	0 - 10	3	0	0
	0 - 60	7	0	0
2	0 - 10	1	0	0
	0 - 60	6	0	0
3	0 - 10	0	0	0
	0 - 60	9	2	0
4	0 - 10	1	0	0
	0 - 60	14	3	0
5	0 - 10	6	2	0
	0 - 60	29	9	0
6	0 - 10	10	5	0
	0 - 60	95	24	4
7	0 - 10	27	3	0
	0 - 60	167	40	3
8	0 - 10	50	20	0
	0 - 60	214	43	0
9	0 - 10	34	6	0
	0 - 60	207	42	3
10	0 - 10	40	7	0
	0 - 60	187	25	5
11	0 - 10	39	10	0
	0 - 60	209	30	4
12	0 - 10	39	4	0
	0 - 60	192	30	3

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
Hour	Minute	Light Vehicle	Heavy Vehicle	
13	0 - 10	26	2	0
	0 - 60	185	24	2
14	0 - 10	45	4	0
	0 - 60	217	37	2
15	0 - 10	30	3	0
	0 - 60	177	32	0
16	0 - 10	30	6	0
	0 - 60	225	39	0
17	0 - 10	31	8	0
	0 - 60	175	29	0
18	0 - 10	28	3	0
	0 - 60	122	13	0
19	0 - 10	16	1	0
	0 - 60	106	10	0
20	0 - 10	10	0	0
	0 - 60	30	5	0
21	0 - 10	13	1	0
	0 - 60	55	6	0
22	0 - 10	8	0	0
	0 - 60	36	5	0
23	0 - 10	4	0	0
	0 - 60	20	0	0
24	0 - 10	2	0	0
	0 - 60	12	0	0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

SURVEY SHEET FOR TRAFFIC VOLUMES SURVEY

Date : 19/05/94	
Direction No.: 11 (W - N)	
Survey Point : T1	
Name of Surveyor: Alberta Smith y César Pérez Parrales	

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
		Light Vehicle	Heavy Vehicle	
Hour	Minute	Light Vehicle	Heavy Vehicle	
1	0 - 10	0	0	0
	0 - 60	0	0	0
2	0 - 10	0	0	0
	0 - 60	0	0	0
3	0 - 10	0	0	0
	0 - 60	0	0	0
4	0 - 10	0	0	0
	0 - 60	0	0	0
5	0 - 10	1	0	0
	0 - 60	1	0	0
6	0 - 10	1	0	0
	0 - 60	4	1	0
7	0 - 10	0	1	0
	0 - 60	6	1	0
8	0 - 10	5	0	0
	0 - 60	7	0	0
9	0 - 10	1	0	0
	0 - 60	7	2	2
10	0 - 10	0	0	0
	0 - 60	2	0	2
11	0 - 10	0	0	0
	0 - 60	3	0	1
12	0 - 10	0	0	0
	0 - 60	8	0	2

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
		Light Vehicle	Heavy Vehicle	
Hour	Minute	Light Vehicle	Heavy Vehicle	
13	0 - 10	2	0	0
	0 - 60	2	1	0
14	0 - 10	0	0	0
	0 - 60	4	0	0
15	0 - 10	2	0	0
	0 - 60	4	2	0
16	0 - 10	0	0	0
	0 - 60	0	0	0
17	0 - 10	0	0	0
	0 - 60	4	1	0
18	0 - 10	0	0	0
	0 - 60	5	0	0
19	0 - 10	0	0	0
	0 - 60	1	0	0
20	0 - 10	0	0	0
	0 - 60	5	0	0
21	0 - 10	0	0	0
	0 - 60	1	0	0
22	0 - 10	1	0	0
	0 - 60	1	1	0
23	0 - 10	0	0	0
	0 - 60	2	0	0
24	0 - 10	0	0	0
	0 - 60	0	0	0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

SURVEY SHEET FOR TRAFFIC VOLUMES SURVEY

Date :		19/05/94		
Direction No.:		12 (E - N)		
Survey Point :		T1		
Name of Surveyor :		Mirle Zeledón Rivera y Alberto Lacayo		

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
		Light Vehicle	Heavy Vehicle	
Hour	Minute			
1	0 - 10	0	0	0
	0 - 60	0	0	0
2	0 - 10	0	0	0
	0 - 60	0	0	0
3	0 - 10	0	0	0
	0 - 60	0	0	0
4	0 - 10	0	0	0
	0 - 60	1	0	0
5	0 - 10	0	0	0
	0 - 60	1	0	0
6	0 - 10	0	0	0
	0 - 60	1	2	2
7	0 - 10	0	0	0
	0 - 60	2	1	0
8	0 - 10	3	0	0
	0 - 60	9	1	0
9	0 - 10	4	0	2
	0 - 60	11	2	8
10	0 - 10	0	0	4
	0 - 60	7	1	18
11	0 - 10	0	0	3
	0 - 60	13	2	15
12	0 - 10	2	1	0
	0 - 60	12	2	9

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
		Light Vehicle	Heavy Vehicle	
Hour	Minute			
13	0 - 10	0	1	0
	0 - 60	6	3	5
14	0 - 10	0	0	0
	0 - 60	8	3	1
15	0 - 10	3	0	0
	0 - 60	11	0	1
16	0 - 10	1	1	0
	0 - 60	5	2	2
17	0 - 10	2	0	0
	0 - 60	12	0	0
18	0 - 10	0	0	0
	0 - 60	3	0	0
19	0 - 10	0	0	0
	0 - 60	3	1	0
20	0 - 10	0	0	0
	0 - 60	1	0	0
21	0 - 10	2	0	0
	0 - 60	3	0	0
22	0 - 10	2	0	0
	0 - 60	4	1	0
23	0 - 10	0	0	0
	0 - 60	0	0	0
24	0 - 10	0	0	0
	0 - 60	0	0	0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

SURVEY SHEET FOR TRAFFIC VOLUMES SURVEY

Date : 19/05/94				
Direction No.: 2		(E - W)		
Survey Point : T1				
Name of Surveyor : Mirle Zeledón Rivera y Alberto Lacayo				

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle	Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
		Light Vehicle	Heavy Vehicle				Light Vehicle	Heavy Vehicle	
1	0 - 10	1	1	0	13	0 - 10	38	5	0
	0 - 60	3	2	0		0 - 60	201	40	0
2	0 - 10	0	0	0	14	0 - 10	36	6	0
	0 - 60	8	0	0		0 - 60	234	41	0
3	0 - 10	0	0	0	15	0 - 10	40	3	0
	0 - 60	6	0	0		0 - 60	242	45	0
4	0 - 10	5	0	0	16	0 - 10	40	8	0
	0 - 60	14	1	0		0 - 60	257	55	0
5	0 - 10	2	1	0	17	0 - 10	25	4	0
	0 - 60	32	9	0		0 - 60	247	30	0
6	0 - 10	9	3	0	18	0 - 10	36	3	0
	0 - 60	79	26	0		0 - 60	188	24	0
7	0 - 10	38	3	0	19	0 - 10	28	4	0
	0 - 60	200	33	1		0 - 60	160	16	0
8	0 - 10	41	11	1	20	0 - 10	10	5	0
	0 - 60	245	43	13		0 - 60	50	8	0
9	0 - 10	42	6	3	21	0 - 10	22	3	0
	0 - 60	233	34	18		0 - 60	73	13	0
10	0 - 10	38	6	0	22	0 - 10	15	0	0
	0 - 60	245	36	2		0 - 60	50	5	0
11	0 - 10	59	7	1	23	0 - 10	4	0	0
	0 - 60	235	38	1		0 - 60	32	2	0
12	0 - 10	33	3	0	24	0 - 10	0	0	0
	0 - 60	221	38	0		0 - 60	13	0	0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

SURVEY SHEET FOR TRAFFIC VOLUMES SURVEY

Date : 19/05/94				
Direction No.: 4 (E - S)				
Survey Point : T1				
Name of Surveyor: Mirle Zeledón Rivera y Alberto Lacayo				

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle	Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
		Light Vehicle	Heavy Vehicle				Light Vehicle	Heavy Vehicle	
1	0 - 10	0	0	0	13	0 - 10	6	2	0
	0 - 60	1	0	0		0 - 60	35	17	0
2	0 - 10	0	0	0	14	0 - 10	3	3	0
	0 - 60	2	0	0		0 - 60	49	17	0
3	0 - 10	0	0	0	15	0 - 10	11	2	0
	0 - 60	2	0	0		0 - 60	65	14	0
4	0 - 10	0	0	0	16	0 - 10	10	2	0
	0 - 60	2	0	0		0 - 60	62	13	0
5	0 - 10	1	0	0	17	0 - 10	9	4	0
	0 - 60	10	4	0		0 - 60	57	16	0
6	0 - 10	2	0	0	18	0 - 10	7	5	0
	0 - 60	20	11	0		0 - 60	36	17	0
7	0 - 10	8	2	0	19	0 - 10	6	2	0
	0 - 60	36	12	0		0 - 60	31	10	0
8	0 - 10	10	2	1	20	0 - 10	5	0	0
	0 - 60	58	9	1		0 - 60	19	4	0
9	0 - 10	7	2	1	21	0 - 10	2	0	0
	0 - 60	42	16	4		0 - 60	14	3	0
10	0 - 10	6	2	0	22	0 - 10	4	0	0
	0 - 60	45	18	2		0 - 60	13	3	0
11	0 - 10	12	2	0	23	0 - 10	1	2	0
	0 - 60	48	18	0		0 - 60	5	2	0
12	0 - 10	12	1	0	24	0 - 10	0	0	0
	0 - 60	48	13	0		0 - 60	5	0	0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

SURVEY SHEET FOR TRAFFIC VOLUMES SURVEY

Date		19/05/94		
Direction No.:		6 (S - E)		
Survey Point		T1		
Name of Surveyor:		Olga Narváez Miranda y Adalberto Olivas Obregón		

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
		Light Vehicle	Heavy Vehicle	
1	0 - 10	0	0	0
	0 - 60	2	0	0
2	0 - 10	0	0	0
	0 - 60	3	0	0
3	0 - 10	0	0	0
	0 - 60	1	0	0
4	0 - 10	1	0	0
	0 - 60	6	1	0
5	0 - 10	2	1	0
	0 - 60	10	8	0
6	0 - 10	5	2	0
	0 - 60	24	12	0
7	0 - 10	5	2	0
	0 - 60	50	14	0
8	0 - 10	0	0	0
	0 - 60	51	14	2
9	0 - 10	4	3	0
	0 - 60	41	15	2
10	0 - 10	8	1	0
	0 - 60	50	15	0
11	0 - 10	10	5	0
	0 - 60	32	18	0
12	0 - 10	10	2	0
	0 - 60	48	13	0

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
		Light Vehicle	Heavy Vehicle	
13	0 - 10	6	5	0
	0 - 60	28	24	0
14	0 - 10	12	1	0
	0 - 60	61	13	0
15	0 - 10	11	5	0
	0 - 60	54	18	1
16	0 - 10	6	1	0
	0 - 60	42	10	0
17	0 - 10	10	2	0
	0 - 60	55	11	0
18	0 - 10	5	2	0
	0 - 60	34	12	0
19	0 - 10	5	1	0
	0 - 60	28	9	0
20	0 - 10	3	2	0
	0 - 60	23	7	0
21	0 - 10	6	2	0
	0 - 60	17	4	0
22	0 - 10	7	0	0
	0 - 60	15	2	0
23	0 - 10	3	0	0
	0 - 60	8	1	0
24	0 - 10	3	0	0
	0 - 60	4	1	0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

SURVEY SHEET FOR TRAFFIC VOLUMES SURVEY

Date : 19/05/94				
Direction No.: 8 (S - N)				
Survey Point : T1				
Name of Surveyor: Olga Narváez Miranda y Adalberto Olivas Obregón				

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle	Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
Hour	Minute	Light Vehicle	Heavy Vehicle		Hour	Minute	Light Vehicle	Heavy Vehicle	
	0 - 10	0	0	0		0 - 10	0	0	0
1	0 - 60	0	0	0	13	0 - 60	3	1	1
	0 - 10	0	0	0		0 - 10	0	0	0
2	0 - 60	0	0	0	14	0 - 60	3	0	0
	0 - 10	0	0	0		0 - 10	1	0	0
3	0 - 60	0	0	0	15	0 - 60	5	0	0
	0 - 10	0	0	0		0 - 10	1	0	0
4	0 - 60	0	0	0	16	0 - 60	3	1	0
	0 - 10	0	0	0		0 - 10	1	0	0
5	0 - 60	0	0	0	17	0 - 60	6	0	0
	0 - 10	0	0	0		0 - 10	1	1	0
6	0 - 60	0	0	0	18	0 - 60	3	2	0
	0 - 10	0	0	0		0 - 10	0	0	0
7	0 - 60	3	1	0	19	0 - 60	2	0	0
	0 - 10	0	0	0		0 - 10	0	0	0
8	0 - 60	0	0	1	20	0 - 60	1	0	0
	0 - 10	1	0	1		0 - 10	0	0	0
9	0 - 60	9	0	5	21	0 - 60	2	0	0
	0 - 10	1	0	0		0 - 10	0	0	0
10	0 - 60	6	2	1	22	0 - 60	0	0	0
	0 - 10	2	0	0		0 - 10	0	0	0
11	0 - 60	4	1	0	23	0 - 60	1	1	0
	0 - 10	0	0	1		0 - 10	0	0	0
12	0 - 60	2	1	1	24	0 - 60	1	0	0

UNIVERSIDAD NACIONAL DE INGENIERIA
PROGRAMA DE INVESTIGACION Y DOCENCIA EN MEDIO AMBIENTE

SURVEY SHEET FOR TRAFFIC VOLUMES SURVEY

Date		19/05/94		
Direction No.:		5 (S - W)		
Survey Point		T1		
Name of Surveyor:		Olga Narváez Miranda y Adalberto Olivas Obregón		

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
		Light Vehicle	Heavy Vehicle	
Hour	Minute	Light Vehicle	Heavy Vehicle	
1	0 - 10	0	0	0
	0 - 60	0	0	0
2	0 - 10	1	0	0
	0 - 60	1	0	0
3	0 - 10	0	0	0
	0 - 60	0	0	0
4	0 - 10	1	0	0
	0 - 60	5	0	0
5	0 - 10	0	0	0
	0 - 60	1	1	0
6	0 - 10	0	0	0
	0 - 60	8	0	0
7	0 - 10	3	0	0
	0 - 60	28	0	0
8	0 - 10	0	0	0
	0 - 60	30	2	2
9	0 - 10	5	1	0
	0 - 60	28	4	1
10	0 - 10	7	1	0
	0 - 60	42	2	1
11	0 - 10	6	0	0
	0 - 60	36	2	0
12	0 - 10	3	3	0
	0 - 60	29	4	0

Survey Hour		Traffic Volume of Vehicle other than Waste Haulage Vehicles		Waste Haulage Vehicle
		Light Vehicle	Heavy Vehicle	
Hour	Minute	Light Vehicle	Heavy Vehicle	
13	0 - 10	8	0	0
	0 - 60	31	0	0
14	0 - 10	5	1	0
	0 - 60	34	4	1
15	0 - 10	10	0	0
	0 - 60	44	3	1
16	0 - 10	5	0	0
	0 - 60	34	2	0
17	0 - 10	5	0	0
	0 - 60	26	0	1
18	0 - 10	1	0	0
	0 - 60	20	0	0
19	0 - 10	3	0	0
	0 - 60	18	0	0
20	0 - 10	2	0	0
	0 - 60	13	1	0
21	0 - 10	2	0	0
	0 - 60	6	0	0
22	0 - 10	1	0	0
	0 - 60	4	0	0
23	0 - 10	0	0	0
	0 - 60	2	0	0
24	0 - 10	0	0	0
	0 - 60	0	0	0

DATA D

SURVEY DATA OF ACAHUALINCA NEWLY PROPOSED LANDFILL SITE

D 1. TOPOGRAPHICAL SURVEY DATA

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MEMORIA DE CALCULO

PROYECTO LEVANTAMIENTO TOPOGRAFICO Y ESTUDIO DE USO DEL SUELO EN EL SECTOR DEL RELLENO SANITARIO DE ACAHUALINCA

Febrero 1995

INTRODUCCION

En Julio de 1994 LAMSA INGENIEROS CONSULTORES, le realizó a JICA STUDY TEAM estudio topográfico de 100 Ha y estudio de uso de suelo de 400 Ha, todo esto fue realizado de acuerdo a los términos de referencia presentados por el Dueño.

El presente estudio consiste en el levantamiento topográfico de 400 Ha y 1,000 Ha de estudio de uso de suelo, el cual es continuación del estudio anteriormente mencionado.

El día 25 Noviembre de 1994, se firmó el contrato entre LAMSA INGENIEROS CONSULTORES y JICA STUDY TEAM para realizar el presente estudio.

Ubicación

El proyecto se encuentra ubicado en el Barrio Acahualinca en el sector Nor-Oeste de la ciudad de Managua, comprendiendo el sector del relleno sanitario (basurero) de Acahualinca y sus barrios aledaños.

Objetivos

El Estudio topográfico tiene como objetivos principales:

- 1.- Obtener levantamiento planialtímetro de 400 Ha de terreno en el sector de relleno sanitario de Acahualinca.
- 2.- Obtener la distribución del uso del suelo en un área de 1,000 Ha en el sector del relleno sanitario de Acahualinca y barrios aledaños.

Descripción del Trabajo

El proyecto consiste en la realización de :

- a.- Estudio Topográfico Planialtimétrico de 400 Ha de tierra, de acuerdo a solicitud del DUEÑO en el sector de Acahualinca, con curvas a cada dos metro y con una precisión menor de 2 cms por kilómetro de nivelación.
- b.- Estudio del uso de suelo en un área de 1,000 Ha de tierra, que abarca la zona del relleno sanitario de Acahualinca y Barrios aledaños.

Estudios Topográficos

Actividades de Campo y Oficina

El levantamiento topográfico fue realizado por medio del taquímetro electrónico REC ELTA 15 y Cuadrillas de topografía convencionales, con el cual se obtuvieron todas las informaciones necesarias procedente del campo.

Este levantamiento topográfico se inicia a partir de la línea base "C" definida en el estudio anterior, realizado en julio de 1994. Del punto de inicio de la línea base "C" a 200 mts con dirección hacia el Norte se define punto de intersección con las siguientes coordenadas Norte 1,344,199, Este 575,190 y elevación de 44.45 mts sobre el nivel del mar, estableciéndose nueva línea base denominada "D" perpendicular a la línea base mencionada anteriormente con una longitud de 2,400 mts con dirección Nor-Oeste.

En el punto final de la línea base "D" se establece punto de intersección con un ángulo de 90° definiéndose línea Base "E" con dirección Norte y Sur y una longitud de 644 mts y 827 mts respectivamente.

La línea base "C" se prolongó en dirección sur de la línea base "D" en 559 mts intersectándose con dirección oeste con la línea base "E", la que presenta una longitud de 2,390 mts, denominandola línea base "F".

Una vez definida la poligonal se establecen punto auxiliares de control utilizados en las radiaciones de todos los puntos en el terreno, definiéndose caminos, cauces, cercas, etc. Cabe señalar que el taquímetro electrónico REC ELTA 15 calcula las coordenadas y elevaciones de todos los puntos a través de los puntos auxiliares establecidos con anterioridad, los cuales son almacenados en su memoria electrónica. Acompañamos información escrita obtenido por el Taquímetro Rec Elta 15.

Se abrieron trochas en todas las líneas bases y a cada 100 mts perpendicular a la línea base "D" con direcciones Norte y Sur, a través de brigadas de topografía convencionales utilizando teodolitos y cinta. En los cerros se crearon trochas a intervalos de 25 mts, con el objetivo de dar una mejor proyección en la toma de los puntos en estas áreas.

Se colocaron BMs. auxiliares sobre la línea base "D" a una distancia promedio de 400 mts, a través de un banco de nivel geodésico establecido por INETER (C-15-R) con elevación 54.1773 MSNM, ubicado en muro de concreto en la esquina sur-este de la sección de recepción de vehículos de Casa Pellas.

Los BMs están constituidos por un monolito de concreto de 0.20m x 0.20m x 0.5m reforzado con una varilla de acero de 1/4" de diámetro.

Se realizó nivelación convencional con equipo corriente de topografía, a lo largo de la poligonal sobre las líneas bases, en el borde del lago y en las líneas bases auxiliares definidas por las trochas como método de verificación del trabajo hecho con el equipo electrónico.

Ingenieros de LAMSA, recorrieron el campo a fin de verificar la información obtenida en el plano de curvas de nivel y obtener el nombre y linderos de las propiedades comprendidas en el estudio topográfico.

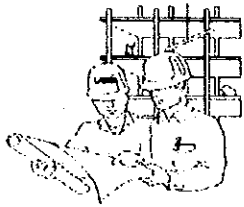
Una vez almacenada la información en el Taquímetro Electrónico, estas son transferidas y procesadas en nuestros sistemas computarizados creando los respectivos formatos para ser recepcionados en el sistema CAD, que a través de la aplicación DTM (Digital Terrain Modeling) se procesan los puntos para crear una modelización del terreno, para ello se realiza lo que se conoce como TIN (Triangular Irregular Network), que es el método más preciso de interpolación de elevaciones, resultando de estos las curvas de niveles en cualquier parte del terreno.

Estudio de Uso de Suelo

El Consultor preparó mapa básico de la zona de estudio, el cual fue aprobado por el Ingeniero representante del dueño del proyecto. Posteriormente se realizó inspección en el sitio del estudio por un Ingeniero y dos asistentes, con el fin de definir inventario en cada sector de acuerdo a las categorías Residenciales, Industriales, Comerciales, Agrícola, etc., estableciendo el verdadero uso de suelo.

Después de revisar y ubicar en el mapa la información de campo, se procedió a verificar en el campo con el auxilio del mapa de uso del suelo, las posibles correcciones u omisiones del levantamiento inicial.

El mapa de uso de suelo abarca una área de 1,000 Ha definida por el dueño, y se representa en un mapa a escala 1:5,000.



LAMSA INGENIEROS CONSULTORES

Arbolito 2c. al Norte y 1/2c. al Este
Aparados 3864 - 3865
Teléfonos 665428 - 665453 - 665492 - 664380
FAX 661138
Managua, Nicaragua

Managua, 24 de Marzo de 1995.

Engineer
JUNJI ANAI
JICA STUDY TEAM

DEAR ENGINEER ANAI:

Enclosed you will find the Topographic Survey Report of 400 ha, and the Land Use Study of 1,000 ha nearby the Acahualinca's disposal site in Managua.

The report contain description how the job was done and memory calculation of the plan surveying that was utilized in an elaboration of the plans.

We hope that the information given satisfy your's need you whole satisfaction, without and more references your truly.


Ing. Gilberto Cuadra
Gerente General



INDEX

- **INTRODUCTION**
- **LOCATION**
- **OBJECTIVE**
- **JOB DESCRIPTION**
- **TOPOGRAPHIC STUDY
(ACTIVITIES FROM THE FIELD AND OFFICE)**
- **LAND USE STUDY**
- **LOCATION MAP**
- **CALCULATION MEMORY**

ELEVATION SURVEYING PROJECT AND LAND USE STUDY OF THE FUTURE SANITARY REFILLING SECTOR OF ACAHUALINCA.

INTRODUCTION

During July 1994 LAMSA INGENIEROS CONSULTORES, performed a Topographical Study for JICA STUDY TEAM of 100 Hectares and a Land Use Study of 400 Hectares, all accomplished in accordance to the Terms of Reference submitted by the owner.

The present Study consists of on elevation surveying of 400 hectares and 1,000 hectares of Land Use Study, which is a continuation of the previously mentioned Study.

On November 25, 1994, the contract was signed between LAMSA INGENIEROS CONSULTORES and JICA STUDY TEAM to perform the present Study.

LOCATION

The project is located nearby the Barrio Acahualinca (subdivision), at the Northwest sector of the city of Managua, comprising part of the sanitary refilling (garbage dump) of Acahualinca and bordering subdivisions.

OBJECTIVES

The topographical study has as its main objectives:

1. To obtain plane surveying of 400 hectares of land at the Acahualinca sanitary refilling sector.
2. To obtain the distribution of land use of an area of 1,000 hectares at the Acahualinca sanitary refilling sector and bordering subdivisions.

WORK DESCRIPTION

The project consists in the performance of:

- a.- Plane Surveying Study of 400 hectares of land, in accordance to owner's request at the Acahualinca sector, with contour lines every two meters with a keen precision of less than 2 centimeters per leveling kilometer.
- b.- Land Use Study for an area of 1,000 hectares of land, which comprises the Acahualinca sanitary refilling zone and bordering subdivisions.

SURVEYING STUDIES

Camp and Office Activities

The topographical elevation procedures were performed by means of an electronic tachimeter REC ELTA 15, and conventional surveying crews, from which all necessary field information was obtained.

This new topographical study took off from, the starting point of base line "C", defined in the previous study performed on July 1994. From the starting point of base line "C", at 200 meter going North, we established a new point of intersection defined with the following coordinates: north 1,344,100, East 575,190, and elevation of 44.45 meters over sea level, establishing, a new base line named "D", perpendicular to the base line previously mentioned, with a length of 2,400 meters going on North west direction.

At the final point of base line "D" the point of intersection is established at an angle of 90°, defining it: base line "E", with North and South direction and length of 644 meters and 827 meters respectively.

Line "C" was extended in South direction from base line "D" in 559 meters, intersecting in west direction with base line "E", which presents a length of 2,390 meters.

Once the base lines were defined, we established auxiliary points of control, used in the radiations of all points in the land, defining: footpaths, ditches, fences, etc. It should be well pointed out that electronic tachymeter REC ELT 15 computes coordinates and elevations of all points through the previously established auxiliary points, which are stored in its electronic memory. We include written information obtained by the tachymeter REC ELTA 15.

Cross paths were open at all base lines and at every 100 meters perpendicular to base line "D" with North and South directions, through conventional surveying crews, using theodolites and measuring tapes. On hills, cross paths were created at intervals of 25 meters, with the purpose of obtaining a better projection of point takings in these areas.

Auxiliary BM's were placed on base line "D" at an average distance of 400 meters through a geodetical level bank established by INETER (C-15-R) with MSNM elevation of 54,1773, located on a concrete wall at the south-east corner of the vehicle admission section of Casa Pellas.

The BM's are made of concrete monolith of 0.20m x 0.20m x 0.5m, with a steel reinforcement bar 1/4 in. in diameter.

Conventional levelling was performed with normal topographic equipment, at full broken line length on base lines, at the border of the lake and at the auxiliary base lines as defined by cross paths as a verifying method of the work performed with the electronic equipment.

LAMSA personnel went all over the field with the purpose of verifying information obtained in the contour line plane and get the name and property line boundaries of properties covered by the survey study.

Once the information was stored in the Electronic Tachymeter, these were transferred and processed in our computer systems, creating the respective formats to be admitted in the CAD system, which through the application of DTM (Digital Terrain Modeling) process points to create a terrain modeling, for that purpose there is performed what is known as Tin (Triangular Irregular Network), which is the more precise interpolation of elevations, turning out from these the contour lines at any part of the terrain.

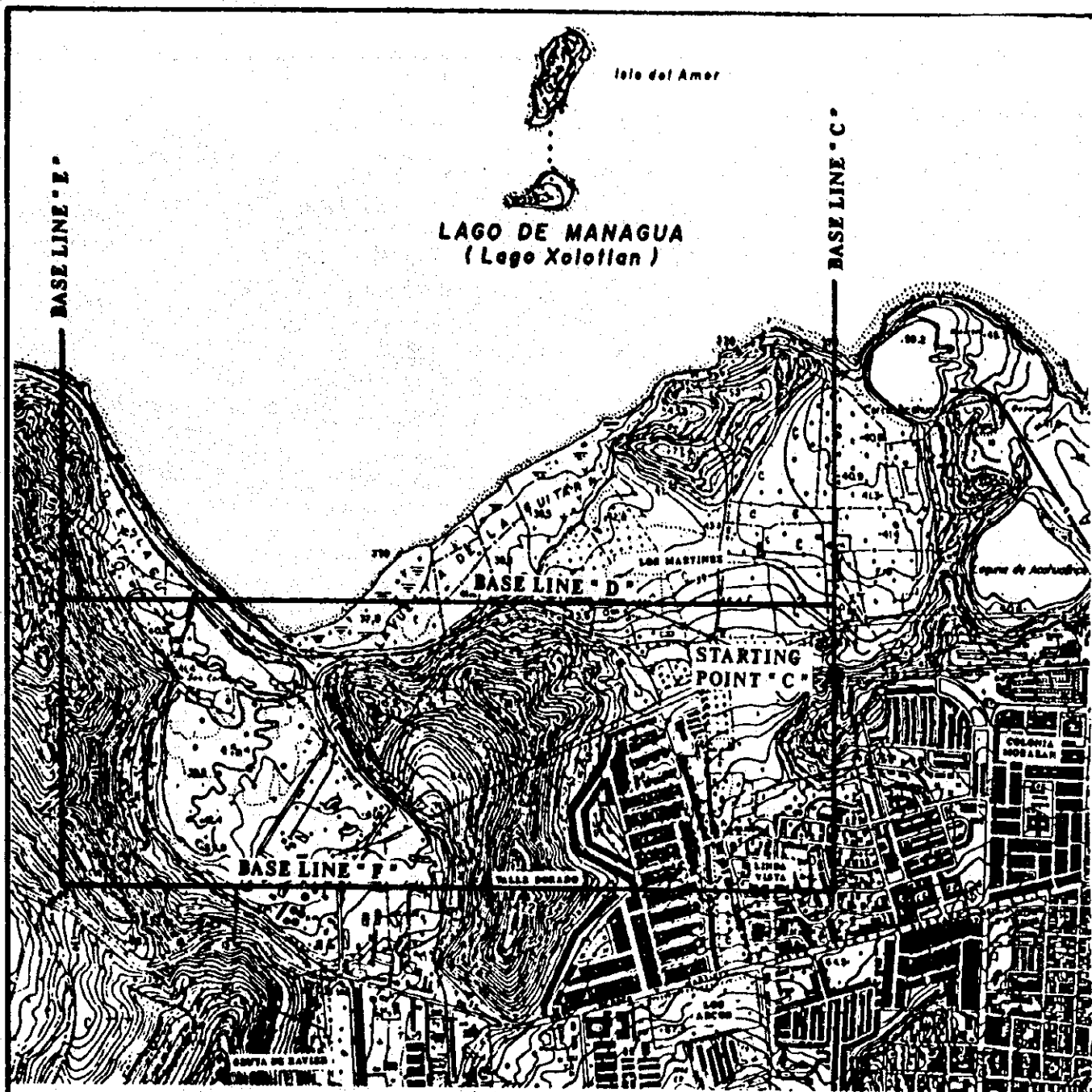
Study of Land Use

The Consultant prepared a basic map of the zone under study, which was approved by the Engineer representing the owner of the project. Subsequently an inspection was performed at the site of the study by an Engineer and two assistants, with the purpose of establishing inventory at each sector according to Residential, Industrial, Commercial, and Agricultural categories, etc, determining the real use of the land.

After checking and locating field information on the map, there took place a field verification with the aid of land use map, of possible corrections and or omissions in the initial surveying.

The land use map comprises an area of 1,000 hectares as defined by the owner, and is presented in a map with a scale of 1:5,000.

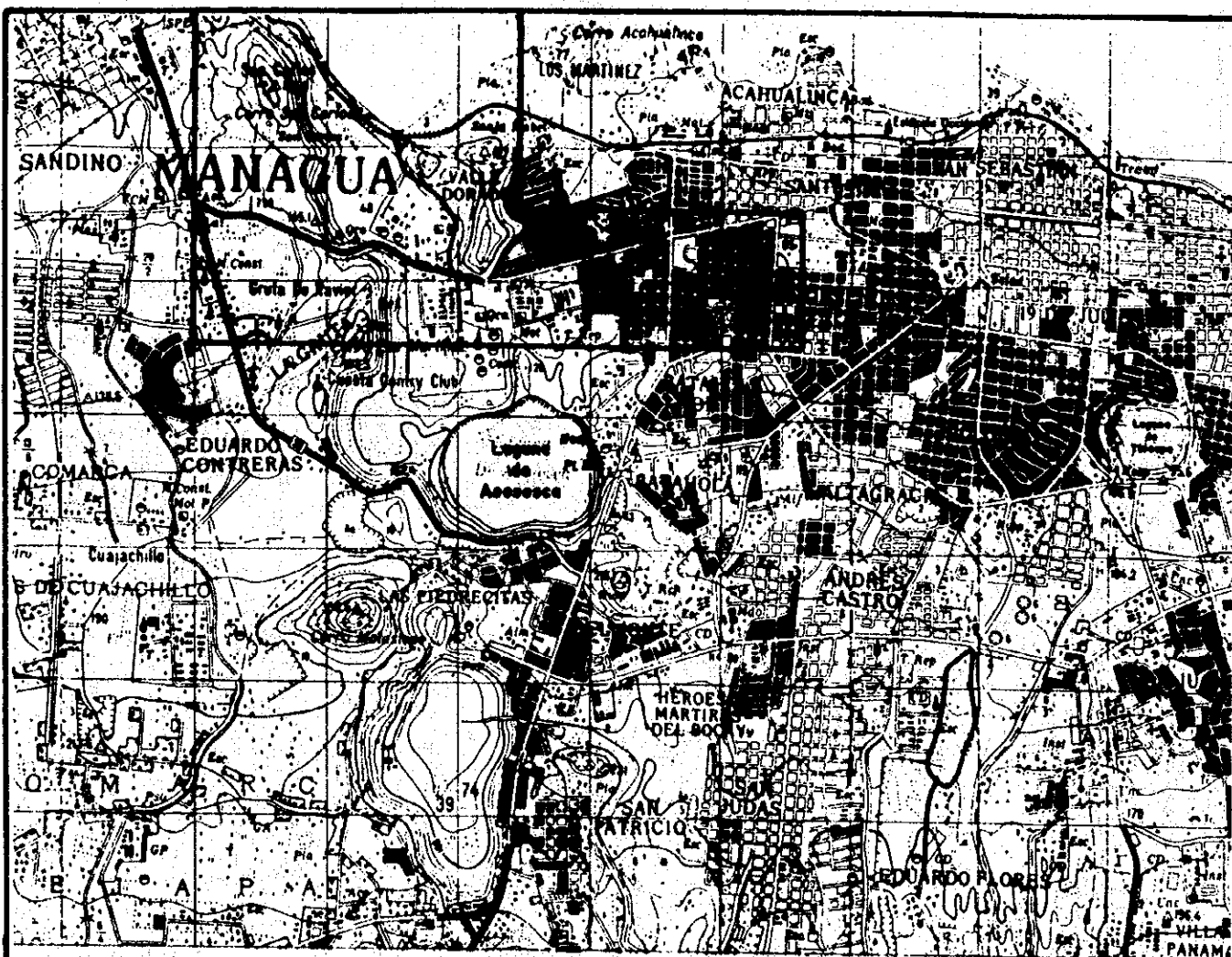
LOCATION MAP



AREA OF STUDY MAP LOCATION

TOPOGRAPHIC SURVEY OF ACAHUALINCA

LAMSA, INGENIEROS CONSULTORES



AREA OF STUDY MAP LOCATION

LAND USE MAP OF ACAHUALINCA

LAMSA, INGENIEROS CONSULTORES

CALCULATION MEMORY

**ACAHUALINCA PROJECT
TOPOGRAPHIC SURVEY
MOST SIGNIFICANT DATA POINTS**

DESCRIPTION	NORTH	EAST	ELEVATION
Base Line "D" Start Point	1,344,199	575,190	44.45
Base Line "D" Point- 1	1,344,202	575,290	45.08
Base Line "D" Point- 2	1,344,205	575,390	45.52
Base Line "D" Point- 3	1,344,211	575,590	45.41
Base Line "D" Point- 4	1,344,216	575,770	44.25
Base Line "D" Point- 5	1,344,220	575,910	43.27
Base Line "D" Point- 6	1,344,222	575,990	43.07
Base Line "D" Point- 7	1,344,211	576,027	44.50
Base Line "D" Point- 8	1,344,226	576,084	44.80
Base Line "D" Point- 9	1,344,226	576,150	42.78
Base Line "D" Point- 10	1,344,232	576,350	37.95
Base Line "D" Point- 11	1,344,238	576,550	37.30
Base Line "D" Point- 12	1,344,247	576,870	36.76
Base Line "D" Point- 13	1,344,254	577,141	43.11
Base Line "D" Point- 14	1,344,259	577,311	41.26
Base Line "D" Point- 15	1,344,261	577,391	41.28
Base Line "D" Point- 16	1,344,262	577,451	51.40
Base Line "D" end Point - Intersection with Base Line "E"	1,344,263	577,580	114.00
Base Line "E" North end Point	1,344,907	577,580	36.00
Base Line "E" South end point Intersection with Base Line "F" Point	1,343,436	577,580	145.00
Base Line "F" Start Point Intersection of Base Line with Base Line "C"	1,343,440	575,190	58.00
Base Line "C" North end point	1,345,370	575,190	35.75
Bore Hole #1	1,344,428	575,333	42.41
Bore Hole #2	1,344,391	575,700	42.68
Bore Hole #3	1,344,386	576,170	37.15
Bench Mark #1	1,344,199	575,190	44.44
Bench Mark #2	1,344,211	575,590	45.38
Bench Mark #3	1,344,222	575,990	43.10
Bench Mark #4	1,344,233	576,390	37.80
Bench Mark #5	1,344,249	576,950	36.75
Bench Mark #6	1,344,258	577,291	41.73
Auxiliary Point - 6t	1,345,032	575,048	49.87
Auxiliary Point - 6s	1,344,741	575,432	37.47
Auxiliary Point - 6n	1,344,662	575,462	63.55
Auxiliary Point - 6p	1,344,511	575,485	73.09
Auxiliary Point - 6r	1,344,698	575,487	60.43
Auxiliary Point - 6m	1,344,719	575,503	53.23
Auxiliary Point - 6n	1,344,842	575,603	63.55
Auxiliary Point - 6j	1,344,637	575,617	76.12
Auxiliary Point - 6z	1,344,113	575,624	46.02
Auxiliary Point - 6r	1,344,836	575,647	60.43
Auxiliary Point - 6j	1,344,584	575,652	76.12
Auxiliary Point - 6m	1,344,830	575,672	53.23
Auxiliary Point - 6i	1,344,647	575,676	77.05

**ACAHUALINCA PROJECT
TOPOGRAPHIC SURVEY
MOST SIGNIFICANT DATA POINTS**

DESCRIPTION	NORTH	EAST	ELEVATION
Auxiliary Point -6k	1,344,663	575,676	78.16
Auxiliary Point -6h	1,344,639	575,677	76.44
Auxiliary Point -6o	1,344,665	575,749	69.92
Auxiliary Point -6g	1,344,096	575,786	46.36
Auxiliary Point -6q	1,344,666	575,788	61.77
Auxiliary Point -6f	1,344,208	575,799	44.83
Auxiliary Point -6y	1,343,979	575,839	52.05
Auxiliary Point -6e	1,344,244	575,881	43.65
Auxiliary Point -6d	1,344,215	575,895	43.65
Auxiliary Point -6c	1,344,222	575,957	42.93
Auxiliary Point -6b	1,344,211	575,970	43.04
Auxiliary Point - 6x	1,344,039	575,973	76.74
Auxiliary Point - 2c	1,344,086	575,981	72.19
Auxiliary Point -6c	1,344,212	575,985	43.09
Auxiliary Point -8b	1,344,185	575,985	41.52
Auxiliary Point -6c	1,344,246	575,987	42.81
Auxiliary Point -6a	1,344,222	575,990	43.08
Auxiliary Point -dr2d	1,343,991	575,994	82.78
Auxiliary Point -2a	1,343,843	576,013	108.57
Auxiliary Point -8a	1,344,216	576,072	41.11
Auxiliary Point -7a	1,344,175	576,114	48.48
Auxiliary Point -2b	1,343,911	576,147	129.18
Auxiliary Point -cr2e	1,343,881	576,153	128.97
Auxiliary Point -9a	1,344,217	576,166	42.76
Auxiliary Point -procon1	1,343,294	576,348	49.34
Auxiliary Point-3z	1,343,853	576,534	110.07
Auxiliary Point-3y	1,343,824	576,561	111.79
Auxiliary Point-f1	1,344,796	576,636	36.01
Auxiliary Point -13e	1,344,024	576,753	43.03
Auxiliary Point -13c	1,344,127	577,012	43.27
Auxiliary Point -13b	1,344,121	577,034	42.05
Auxiliary Point -13c	1,344,426	577,083	43.27
Auxiliary Point -13d	1,344,465	577,097	40.59
Auxiliary Point -13a	1,344,123	577,182	42.87
Auxiliary Point -13-a	1,344,348	577,240	42.87
Auxiliary Point - 1ag	1,344,341	577,311	43.23
Auxiliary Point -b	1,344,261	577,320	42.37
Auxiliary Point -1e	1,344,277	577,320	42.16
Auxiliary Point -1d	1,344,285	577,324	42.51
Auxiliary Point - 1f	1,344,111	577,344	41.62
Auxiliary Point -1c	1,344,223	577,380	40.76
Auxiliary Point -5	1,344,538	577,518	42.75
Auxiliary Point -13e	1,344,027	576,704	43.06
Auxiliary Point -13b	1,344,121	577,034	42.06

**ACAHUALINCA PROJECT
TOPOGRAPHIC SURVEY
MOST SIGNIFICANT DATA POINTS**

DESCRIPTION	NORTH	EAST	ELEVATION
Auxiliary Point 3y	1,343,824	576,561	111.79
Auxiliary Point-3x	1,343,854	576,580	114.84
Auxiliary Point -cr-4-q	1,344,598	577,666	120.38
Auxiliary Point -cr-4-r	1,344,825	577,566	56.83
Auxiliary Point -cr-4-r	1,344,825	577,566	56.83
Auxiliary Point -cr-4-s	1,344,835	577,583	56.91
Auxiliary Point -9b	1,344,539	576,226	37.39
Auxiliary Point -9b	1,344,539	576,226	37.39
Auxiliary Point - lago	1,344,299	575,187	42.98
Garbage Dump-1	1,344,946	575,170	48.07
Auxiliary Point-13r	1,344,025	576,641	42.92

ACAUALINCA TOPOGRAPHICS COORDINATES

<u>No</u>	<u>NORTE</u>	<u>ESTE</u>	<u>ELEV.(m)</u>	<u>No.</u>	<u>NORTE</u>	<u>ESTE</u>	<u>ELEV.(m)</u>
1	1344638.93	575676.86	76.44	48	1344222.27	575989.88	43.08
2	1344208.18	575798.92	44.83	49	1343880.96	576153.16	128.97
3	1344040.00	575972.58	76.64	50	1344215.67	576072.31	41.11
4	1344904.33	577426.62	35.64	51	1344240.51	576649.82	37.04
5	1344666.48	575787.65	61.77	52	1344242.36	576649.70	38.09
6	1344665.00	575748.97	69.92	53	1344217.30	576166.12	42.76
7	1344835.63	575646.76	60.36	54	1344246.59	576869.79	36.76
8	1344215.81	575769.88	44.25	55	1344703.33	577103.08	43.03
9	1344095.98	575786.47	46.36	56	1344465.01	577097.48	40.59
10	1344830.21	575671.96	53.24	57	1344242.35	576649.23	37.45
11	1343978.96	575839.00	52.05	58	1344703.14	577102.63	44.04
12	1344112.97	575624.31	46.02	59	1344175.10	576114.41	48.48
13	1344204.69	575389.96	45.52	60	1344796.13	576636.03	36.01
14	1343905.41	575247.66	61.35	61	1343179.61	576368.25	50.50
15	1344835.71	575646.64	60.43	62	1343843.03	576013.30	108.57
16	1344663.38	575676.18	78.16	63	1344210.68	575970.01	43.05
17	1344647.28	575676.08	77.05	64	1344824.78	577566.10	56.83
18	1344842.13	575602.82	63.55	65	1344415.40	577416.35	42.76
19	1344638.93	575676.86	76.44	66	1344261.32	577319.92	42.37
20	1344201.70	575290.06	45.10	67	1344042.02	577629.57	176.50
21	1344208.18	575798.92	44.83	68	1344905.85	577425.99	35.71
22	1344903.44	575661.17	37.47	69	1344258.60	577310.63	41.27
23	1344208.18	575798.92	44.83	70	1344262.45	577450.57	51.40
24	1344210.52	575589.89	45.41	71	1344597.70	577666.19	120.38
25	1344201.72	575289.93	45.08	72	1344276.82	577320.45	42.16
26	1344663.38	575676.18	78.21	73	1343983.74	577604.83	169.66
27	1344226.01	576084.33	44.80	74	1344260.76	577390.60	41.28
28	1344408.40	577067.98	42.05	75	1344719.48	577438.14	43.64
29	1344426.11	577083.37	43.25	76	1344538.07	577518.11	42.75
30	1344222.18	575989.90	43.08	77	1344223.25	577379.88	40.76
31	1344425.97	577082.93	43.28	78	1344834.81	577583.19	56.91
32	1344232.13	576349.93	37.95	79	1344285.39	577324.34	42.51
33	1344226.32	576149.77	42.78	80	1344661.28	575557.08	71.57
34	1344027.07	576704.02	43.06	81	1344663.97	575561.08	71.83
35	1343910.68	576146.67	129.18	82	1344004.44	575556.96	49.35
36	1344028.46	576703.41	44.09	83	1344661.27	575557.08	71.57
37	1344243.88	575881.32	43.65	84	1344741.46	575559.61	54.00
38	1344245.84	575986.70	42.81	85	1343977.95	575556.76	49.81
39	1344210.54	576027.20	44.50	86	1343907.04	575787.32	49.62
40	1344237.59	576549.79	37.30	87	1345220.98	575553.68	35.94
41	1344185.26	575984.77	41.52	88	1345194.47	575560.97	35.91
42	1344086.28	575981.45	72.20	89	1344048.21	575554.59	48.30
43	1343853.71	576580.18	114.84	90	1344479.03	575786.72	41.32
44	1344219.90	575909.92	43.27	91	1344947.38	575554.24	36.85
45	1344539.14	576226.41	37.39	92	1344683.21	575542.00	70.21
46	1344214.71	575894.94	43.66	93	1344660.29	575526.09	70.19
47	1343293.88	576347.59	49.34	94	1345064.37	575525.96	36.20

JAPAN INTERNATIONAL COOPERATION AGENCY