

## **ANEXO 6-2.8**

### **INFORME DE VIBRACIONES AMBIENTALES**



**CSA GROUP PANAMA, INC.**

1822

## **VIBRACIONES AMBIENTALES**

**2021**

**LÍNEA BASE**

## VIBRACIONES AMBIENTALES

### DATOS GENERALES

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Empresa</b>                | CSA GROUP PANAMA, INC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Nombre del Proyecto</b>    | ELABORACIÓN DE UN ESTUDIO DE IMPACTO AMBIENTAL CATEGORÍA III, PARA EL PROYECTO DE CRUCE DE LA LÍNEA 3 POR DEBAJO DEL CANAL DE PANAMÁ, MISMO QUE SERÁ PRESENTADO ANTE EL MINISTERIO DE AMBIENTE PARA EVALUACIÓN Y APROBACIÓN.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Ubicación del Proyecto</b> | Canal de Panamá                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Contraparte Técnica</b>    | Ing. María Lee                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Fecha de Medición</b>      | Mayo – Julio de 2021                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Metodología</b>            | Registro continuo de 30 minutos para cada una de las 10 estaciones, no se estableció un nivel de “trigger” o umbral con el fin de registrar todo el rango de vibraciones presentes. Para cada sitio fueron tomadas 1000 muestras cada segundo. Fueron calculados los tres componentes de las velocidades máxima o pico de la partícula VPP en unidades mm/s. con sus respectivos periodos promedios. Se estableció una ventana de cada 60 segundos para el cálculo de los tres componentes; longitudinal o radial, transversal y vertical. Para el registro de las señales sísmicas fue utilizado como sismógrafo marca NOMIS modelo 5400 X2G. |
| <b>Normas Aplicables</b>      | UNE 22381:1993, USBM RI8507, Anteproyecto Vibraciones Ambientales Panamá                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Objetivo</b>               | Determinar los niveles de las vibraciones del suelo producidas principalmente por la rodadura de los vehículos, y otras fuentes generadoras cercana a las estaciones de monitoreo.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

**EQUIPO UTILIZADO**

|                                                                  |                     |                                                                                    |
|------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------|
| <div> <div>Marca</div> <div>Modelo</div> <div>Serie</div> </div> | <div>NOMIS</div>    |  |
|                                                                  | <div>5400 X2G</div> |                                                                                    |
|                                                                  | <div>2215</div>     |                                                                                    |

## ESTACIONES DE MONITOREO DÍA DE SEMANA

| Fecha y Hora                                | Estación de Monitoreo                              | Coordenadas (m)        | Comentarios                                                                                                       | Fotos                                                                                 |
|---------------------------------------------|----------------------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 27/05/21<br>9:52 am<br>28/05/21<br>8:35 pm  | Urbanización Rainforest Village – EM17A            | N: 999371<br>E: 660486 | Sensor en suelo. Circulación de autos y maquinarias ocasional hacia la barriada (en horario diurno).              |    |
| 27/05/21<br>12:13 pm<br>28/05/21<br>6:16 pm | PPC – EM9                                          | N: 990330<br>E: 658125 | Sensor en suelo. Actividades movimiento constante de cargas.                                                      |    |
| 27/05/21<br>1:10 pm<br>28/05/21<br>7:31 pm  | Pegado a la cerca de Panamá Railway Company – EM12 | N: 991024<br>E: 658715 | Sensor en suelo. Actividad del ferrocarril, circulación vehicular vía Omar Torrijos.                              |   |
| 11/06/21<br>9:53 am<br>11/06/21<br>7:19 pm  | Campamento Oeste 5k+800 – EM 1B                    | N: 989479<br>E: 655464 | Sensor en suelo. La única actividad cercana es el tráfico vehicular de la carretera Panamericana (área de Farfán) |  |
| 11/06/21<br>10:56 am<br>11/06/21<br>7:57 pm | Campamento Oeste 5k+200 – EM6                      | N: 988989<br>E: 655783 | Sensor en suelo. La única actividad cercana es el tráfico vehicular de la carretera Panamericana (área de Farfán) |  |

|                                                          |                                                                                  |                                |                                                                                                                                                              |                                                                                       |
|----------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <p>11/06/21<br/>12:33 pm</p> <p>11/06/21<br/>9:06 pm</p> | <p>Policía Nacional –<br/>EM13</p>                                               | <p>N: 991633<br/>E: 659122</p> | <p>Sensor en suelo. Actividad de circulación más próxima es la vía Corredor Norte y Terminal de Transporte de Albrook, Estación Albrook (Metro Línea 1).</p> |    |
| <p>2/07/21<br/>9:42 am</p> <p>2/07/21<br/>7:03 pm</p>    | <p>Edificio 69 ACP –<br/>EM11</p>                                                | <p>N: 990570<br/>E: 658433</p> | <p>Sensor en suelo. Tráfico vehicular constante en la Avenida Ascanio Arosemena.</p>                                                                         |    |
| <p>23/07/21<br/>12:04 pm</p> <p>26/07/21<br/>6:30 pm</p> | <p>Fundación Nueva<br/>Vida (Hogar de<br/>Ancianos) - EM8C</p>                   | <p>N: 987702<br/>E: 655717</p> | <p>Sensor en suelo. Casi no hay circulación vehicular en el residencial.</p>                                                                                 |   |
| <p>23/07/21<br/>1:08 pm</p> <p>26/07/21<br/>7:04 pm</p>  | <p>Fundación Nueva<br/>Vida (Guardería)<br/>- EM8D</p>                           | <p>N: 987967<br/>E: 655457</p> | <p>Sensor en suelo. Casi no hay circulación vehicular en el residencial.</p>                                                                                 |  |
| <p>23/07/21<br/>9:44 am</p> <p>23/07/21<br/>6:33 pm</p>  | <p>Sitio de<br/>Disposición de<br/>Farfán<br/>(Campamento<br/>4K+600) - EM8B</p> | <p>N: 988906<br/>E: 656161</p> | <p>Sensor en suelo. La única actividad cercana es el tráfico vehicular en la Terminal de Transporte de Albrook, Estación Albrook (Metro Línea 1).</p>        |  |

## ESTACIONES DE MONITOREO FÍN DE SEMANA

| Fecha y Hora                                    | Estación de Monitoreo                              | Coordenadas (m)        | Comentarios                                                                                                        | Fotos                                                                                 |
|-------------------------------------------------|----------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 29/05/21<br>9:51 am<br><br>5/06/21<br>6:59 pm   | Urbanización Rainforest Village – EM17A            | N: 999371<br>E: 660486 | Sensor en suelo. Circulación de autos y maquinarias ocasional hacia la barriada (en horario diurno).               |    |
| 29/05/21<br>11:25 Am<br><br>5/06/21<br>8:38 pm  | PPC – EM9                                          | N: 990330<br>E: 658125 | Sensor en suelo. Actividades movimiento constante de cargas.                                                       |    |
| 29/05/21<br>12:13 pm<br><br>5/06/21<br>7:55 pm  | Pegado a la cerca de Panamá Railway Company – EM12 | N: 991024<br>E: 658715 | Sensor en suelo. Actividad del ferrocarril, circulación vehicular vía Omar Torrijos.                               |   |
| 12/06/21<br>9:47 am<br><br>12/06/21<br>7:01 pm  | Campamento Oeste 5k+800 – EM 1B                    | N: 989479<br>E: 655464 | Sensor en suelo. La única actividad cercana es el tráfico vehicular de la carretera Panamericana (área de Farfán). |  |
| 12/06/21<br>10:32 am<br><br>12/06/21<br>7:57 pm | Campamento Oeste 5k+200 – EM6                      | N: 988989<br>E: 655783 | Sensor en suelo. La única actividad cercana es el tráfico vehicular de la carretera Panamericana (área de Farfán). |  |

|                                                          |                                                                  |                                |                                                                                                                                                              |                                                                                       |
|----------------------------------------------------------|------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <p>12/06/21<br/>12:17 pm</p> <p>12/06/21<br/>8:44 pm</p> | <p>Policía Nacional –<br/>EM13</p>                               | <p>N: 991633<br/>E: 659122</p> | <p>Sensor en suelo. Actividad de circulación más próxima es la vía Corredor Norte y Terminal de Transporte de Albroom, Estación Albroom (Metro Línea 1).</p> |    |
| <p>3/07/21<br/>8:04 am</p> <p>3/07/21<br/>6:46 pm</p>    | <p>Edificio 69 ACP –<br/>EM11</p>                                | <p>N: 990570<br/>E: 658433</p> | <p>Sensor en suelo. Tráfico vehicular constante en la Avenida Ascanio Arosemena.</p>                                                                         |    |
| <p>24/07/21<br/>10:00 am</p> <p>24/07/21<br/>6:51 pm</p> | <p>Fundación Nueva Vida (Hogar de Ancianos) - EM8C</p>           | <p>N: 987702<br/>E: 655717</p> | <p>Sensor en suelo. Casi no hay circulación vehicular en el residencial.</p>                                                                                 |  |
| <p>24/07/21<br/>5:36 pm</p> <p>24/07/21<br/>6:27 pm</p>  | <p>Fundación Nueva Vida (Guardería) - EM8D</p>                   | <p>N: 987967<br/>E: 655457</p> | <p>Sensor en suelo. Casi no hay circulación vehicular en el residencial.</p>                                                                                 |  |
| <p>24/07/21<br/>8:57 am</p> <p>24/07/21<br/>7:19 pm</p>  | <p>Sitio de Disposición de Farfán (Campamento 4K+600) - EM8B</p> | <p>N: 988906<br/>E: 656161</p> | <p>Sensor en suelo. La única actividad cercana es el tráfico vehicular en la carretera Panamericana (área de Farfán).</p>                                    |  |

**RESULTADOS DÍA DE SEMANA**

| PUNTO 1 EM17A Urbanización Rainforest Village - Diurno               |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.13              | 166.7            | 0.13              | 41.7             |
| 0.13                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 35.7             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 55.6             |
| 0.13                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 25.0             |
| 0.13                                                                 | 250.0            | 0.13              | 83.3             | 0.13              | 31.3             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 62.5             |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 83.3             |
| 0.13                                                                 | 500.0            | 0.13              | 125.0            | 0.13              | 62.5             |
| 0.13                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 100.0            |
| 0.13                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 33.3             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 83.3             |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 33.3             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 83.3             |
| 0.13                                                                 | 166.7            | 0.13              | 83.3             | 0.13              | 16.1             |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 45.5             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 62.5             |
| 0.13                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 41.7             |
| 0.13                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 166.7            |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 1 EM17A Urbanización Rainforest Village - Nocturno             |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.44                                                                 | 8.5              | 0.38              | 9.4              | 1.02              | 7.6              |
| 0.25                                                                 | 11.1             | 0.19              | 12.8             | 0.44              | 10.2             |
| 0.25                                                                 | 11.4             | 0.32              | 9.8              | 0.64              | 9.1              |
| 0.25                                                                 | 11.1             | 0.19              | 9.8              | 0.57              | 7.9              |
| 0.44                                                                 | 9.1              | 0.19              | 10.2             | 0.57              | 8.1              |
| 0.19                                                                 | 13.2             | 0.13              | 125.0            | 0.44              | 2.8              |
| 0.32                                                                 | 11.4             | 0.38              | 10.4             | 0.83              | 4.0              |
| 0.25                                                                 | 10.9             | 0.25              | 13.5             | 0.64              | 5.5              |
| 0.38                                                                 | 10.2             | 0.25              | 9.4              | 0.70              | 10.6             |
| 0.32                                                                 | 8.5              | 0.25              | 6.3              | 0.89              | 6.5              |
| 0.19                                                                 | 11.1             | 0.19              | 12.8             | 0.44              | 6.4              |
| 0.25                                                                 | 10.0             | 0.25              | 7.6              | 0.76              | 4.3              |
| 0.25                                                                 | 8.3              | 0.25              | 9.6              | 0.44              | 7.4              |
| 0.19                                                                 | 10.2             | 0.32              | 7.8              | 0.64              | 7.7              |
| 0.25                                                                 | 11.1             | 0.25              | 10.2             | 0.51              | 8.8              |
| 0.32                                                                 | 10.6             | 0.19              | 10.4             | 0.51              | 6.9              |
| 0.32                                                                 | 9.8              | 0.32              | 9.3              | 0.76              | 7.8              |
| 0.25                                                                 | 12.8             | 0.19              | 13.2             | 0.76              | 2.9              |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 2 EM9 PPC – Diurno                                             |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.5              | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                 | 166.7            | 0.13              | 100.0            | 0.13              | 125.0            |
| 0.13                                                                 | 125.0            | 0.13              | 100.0            | 0.13              | 71.4             |
| 0.13                                                                 | 83.3             | 0.13              | 125.0            | 0.13              | 38.5             |
| 0.13                                                                 | 500.0            | 0.13              | 166.7            | 0.70              | 22.7             |
| 0.13                                                                 | 500.0            | 0.13              | 125.0            | 0.13              | 55.6             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 22.7             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                 | 125.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 21.7             |
| 0.13                                                                 | 125.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 166.7            |
| 0.13                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 35.7             |
| 0.13                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 31.3             |
| 0.13                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 62.5             |
| 0.13                                                                 | 125.0            | 0.13              | 166.7            | 0.13              | 55.6             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 125.0            |
| 0.06                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 71.4             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 2 EM9 PPC – Nocturno                                           |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.19              | 0.8              | 0.13              | 22.7             |
| 0.13                                                                 | 83.3             | 0.13              | 166.7            | 0.13              | 125.0            |
| 0.13                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 83.3             |
| 0.13                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 71.4             |
| 0.06                                                                 | 250.0            | 0.13              | 100.0            | 0.13              | 31.3             |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 35.7             |
| 0.13                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 166.7            |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 41.7             |
| 0.13                                                                 | 250.0            | 0.13              | 100.0            | 0.13              | 35.7             |
| 0.06                                                                 | 250.0            | 0.13              | 100.0            | 0.13              | 100.0            |
| 0.06                                                                 | 500.0            | 0.13              | 100.0            | 0.13              | 41.7             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 35.7             |
| 0.06                                                                 | 500.0            | 0.13              | 71.4             | 0.13              | 62.5             |
| 0.13                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 41.7             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                 | 166.7            | 0.13              | 250.0            | 0.13              | 71.4             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 22.7             |
| 0.06                                                                 | 250.0            | 0.06              | 166.7            | 0.13              | 71.4             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 3 EM12 Pegado a la cerca de Panamá Railway Company - Diurno    |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.44                                                                 | 10.9             | 0.38              | 9.1              | 0.95              | 9.1              |
| 0.51                                                                 | 9.8              | 0.51              | 10.2             | 1.02              | 8.8              |
| 0.19                                                                 | 11.9             | 0.19              | 11.1             | 0.51              | 4.0              |
| 0.25                                                                 | 10.9             | 0.25              | 13.2             | 0.51              | 8.9              |
| 0.32                                                                 | 9.4              | 0.25              | 13.5             | 0.64              | 7.5              |
| 0.57                                                                 | 10.9             | 0.57              | 10.4             | 1.08              | 8.6              |
| 0.25                                                                 | 11.9             | 0.25              | 11.4             | 0.64              | 11.4             |
| 0.19                                                                 | 11.6             | 0.25              | 11.6             | 0.38              | 5.1              |
| 0.25                                                                 | 12.2             | 0.25              | 11.6             | 0.70              | 3.2              |
| 0.38                                                                 | 8.3              | 0.25              | 11.1             | 0.76              | 5.8              |
| 0.25                                                                 | 10.2             | 0.38              | 9.6              | 0.76              | 7.8              |
| 0.25                                                                 | 12.2             | 0.19              | 13.2             | 0.76              | 4.7              |
| 0.32                                                                 | 6.5              | 0.38              | 11.9             | 0.83              | 7.7              |
| 0.19                                                                 | 8.2              | 0.25              | 6.4              | 0.70              | 4.1              |
| 0.25                                                                 | 9.3              | 0.19              | 10.2             | 0.76              | 4.5              |
| 0.25                                                                 | 10.4             | 0.38              | 9.3              | 0.76              | 8.3              |
| 0.32                                                                 | 11.1             | 0.32              | 9.6              | 0.70              | 7.4              |
| 0.32                                                                 | 12.2             | 0.32              | 9.4              | 0.70              | 6.6              |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 3 EM12 Pegado a la cerca de Panamá Railway Company - Nocturno  |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 6.2              | 0.13              | 166.7            | 0.13              | 71.4             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 35.7             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 166.7            |
| 0.06                                                                 | 500.0            | 0.13              | 125.0            | 0.13              | 41.7             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 23.8             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 23.8             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 166.7            |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 62.5             |
| 0.06                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 31.3             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 23.8             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 35.7             |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 26.3             |
| 0.06                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 45.5             |
| 0.13                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 62.5             |
| 0.13                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 125.0            |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 4 EM1B Campamento Oeste 5k+800 - Diurno                        |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.19              | 2.1              | 0.13              | 62.5             |
| 0.70                                                                 | 125.0            | 0.32              | 125.0            | 0.13              | 71.4             |
| 0.13                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 23.8             |
| 0.13                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 31.3             |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 55.6             |
| 0.06                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 45.5             |
| 0.13                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 250.0            |
| 0.13                                                                 | 166.7            | 0.13              | 250.0            | 0.13              | 83.3             |
| 0.13                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 21.7             |
| 0.13                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 71.4             |
| 0.13                                                                 | 166.7            | 0.13              | 71.4             | 0.13              | 45.5             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 166.7            |
| 0.06                                                                 | 166.7            | 0.13              | 250.0            | 0.13              | 26.3             |
| 0.06                                                                 | 166.7            | 0.13              | 125.0            | 0.13              | 35.7             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 35.7             |
| 0.06                                                                 | 166.7            | 0.13              | 250.0            | 0.13              | 125.0            |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.06                                                                 | 500.0            | 0.13              | 100.0            | 0.13              | 41.7             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 4 EM1B Campamento Oeste 5k+800 - Nocturno                      |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.13              | 125.0            | 0.19              | 11.1             |
| 0.38                                                                 | 9.8              | 0.25              | 9.8              | 0.57              | 10.2             |
| 0.25                                                                 | 14.7             | 0.19              | 12.5             | 0.32              | 9.4              |
| 0.32                                                                 | 10.9             | 0.19              | 11.4             | 0.44              | 8.8              |
| 0.19                                                                 | 8.3              | 0.13              | 100.0            | 0.32              | 10.9             |
| 0.19                                                                 | 15.6             | 0.13              | 38.5             | 0.25              | 7.4              |
| 0.25                                                                 | 12.5             | 0.19              | 12.8             | 0.38              | 10.2             |
| 0.32                                                                 | 10.9             | 0.19              | 12.2             | 0.44              | 9.1              |
| 0.38                                                                 | 11.1             | 0.19              | 15.6             | 0.51              | 11.1             |
| 0.19                                                                 | 12.8             | 0.13              | 55.6             | 0.25              | 9.6              |
| 0.25                                                                 | 14.7             | 0.13              | 23.8             | 0.38              | 11.6             |
| 0.19                                                                 | 10.9             | 0.19              | 18.5             | 0.32              | 9.8              |
| 0.32                                                                 | 12.2             | 0.25              | 10.6             | 0.51              | 8.5              |
| 0.25                                                                 | 10.4             | 0.19              | 13.2             | 0.32              | 11.1             |
| 0.32                                                                 | 13.2             | 0.25              | 9.8              | 0.57              | 7.9              |
| 0.19                                                                 | 12.2             | 0.13              | 166.7            | 0.32              | 10.2             |
| 0.32                                                                 | 10.2             | 0.19              | 12.2             | 0.38              | 9.6              |
| 0.19                                                                 | 0.4              | 0.13              | 125.0            | 0.19              | 11.1             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 5 EM6 Campamento Oeste 5k+200 - Diurno                         |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.19              | 9.4              | 0.13              | 71.4             |
| 0.13                                                                 | 500.0            | 0.13              | 100.0            | 0.13              | 45.5             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 62.5             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.13                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 125.0            |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 125.0            |
| 0.13                                                                 | 250.0            | 0.13              | 100.0            | 0.13              | 100.0            |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 22.7             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 62.5             |
| 0.13                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 250.0            |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 41.7             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 166.7            |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                 | 100.0            | 0.13              | 166.7            | 0.13              | 50.0             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 45.5             |
| 0.13                                                                 | 71.4             | 0.19              | 45.5             | 0.13              | 83.3             |
| 0.57                                                                 | 100.0            | 0.44              | 100.0            | 0.32              | 100.0            |
| 0.13                                                                 | 100.0            | 0.13              | 100.0            | 0.13              | 55.6             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 5 EM6 Campamento Oeste 5k+200 - Nocturno                       |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.254                                                                | 6.8              | 0.254             | 33.3             | 0.191             | 31.3             |
| 0.127                                                                | 125.0            | 0.254             | 31.3             | 0.254             | 45.5             |
| 0.127                                                                | 41.7             | 0.254             | 27.8             | 0.191             | 50.0             |
| 0.191                                                                | 29.4             | 0.254             | 38.5             | 0.254             | 45.5             |
| 0.127                                                                | 100.0            | 0.254             | 27.8             | 0.191             | 41.7             |
| 0.127                                                                | 500.0            | 0.254             | 29.4             | 0.191             | 31.3             |
| 0.127                                                                | 166.7            | 0.318             | 29.4             | 0.191             | 27.8             |
| 0.127                                                                | 71.4             | 0.254             | 29.4             | 0.191             | 31.3             |
| 0.127                                                                | 50.0             | 0.254             | 29.4             | 0.191             | 33.3             |
| 0.191                                                                | 25.0             | 0.254             | 27.8             | 0.445             | 55.6             |
| 0.127                                                                | 29.4             | 0.318             | 29.4             | 0.191             | 38.5             |
| 0.127                                                                | 100.0            | 0.254             | 26.3             | 0.191             | 35.7             |
| 0.127                                                                | 166.7            | 0.254             | 29.4             | 0.191             | 45.5             |
| 0.127                                                                | 166.7            | 0.254             | 29.4             | 0.191             | 35.7             |
| 0.127                                                                | 100.0            | 0.254             | 29.4             | 0.191             | 33.3             |
| 0.127                                                                | 125.0            | 0.254             | 31.3             | 0.191             | 18.5             |
| 0.127                                                                | 62.5             | 0.254             | 29.4             | 0.191             | 33.3             |
| 0.127                                                                | 166.7            | 0.254             | 26.3             | 0.191             | 35.7             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 6 EM13 Policía Nacional – Diurno                               |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.32                                                                 | 11.4             | 0.19              | 13.2             | 0.32              | 9.8              |
| 0.25                                                                 | 9.4              | 0.19              | 10.4             | 0.44              | 8.3              |
| 0.19                                                                 | 13.2             | 0.19              | 10.6             | 0.32              | 8.1              |
| 0.32                                                                 | 12.5             | 0.19              | 10.2             | 0.38              | 10.4             |
| 0.19                                                                 | 10.4             | 0.19              | 9.1              | 0.32              | 9.1              |
| 0.13                                                                 | 22.7             | 0.13              | 45.5             | 0.19              | 10.6             |
| 0.19                                                                 | 38.5             | 0.32              | 27.8             | 0.25              | 11.4             |
| 0.19                                                                 | 11.6             | 0.13              | 55.6             | 0.25              | 8.3              |
| 0.19                                                                 | 9.6              | 0.13              | 62.5             | 0.32              | 7.6              |
| 0.32                                                                 | 8.8              | 0.19              | 11.1             | 0.44              | 6.8              |
| 0.19                                                                 | 12.8             | 0.13              | 31.3             | 0.19              | 5.8              |
| 0.19                                                                 | 14.3             | 0.13              | 26.3             | 0.25              | 7.6              |
| 0.19                                                                 | 10.0             | 0.13              | 71.4             | 0.25              | 8.2              |
| 0.25                                                                 | 9.6              | 0.19              | 16.1             | 0.44              | 7.8              |
| 8.70                                                                 | 125.0            | 1.71              | 166.7            | 4.70              | 16.7             |
| 0.25                                                                 | 11.9             | 0.19              | 11.1             | 0.32              | 8.8              |
| 0.25                                                                 | 10.6             | 0.19              | 11.6             | 0.32              | 7.0              |
| 0.19                                                                 | 12.5             | 0.19              | 11.6             | 0.25              | 8.9              |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 6 EM13 Policía Nacional – Nocturno             |                  |                   |                  |                   |                  |
|------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.191                                                | 0.4              | 0.191             | 3.6              | 0.127             | 71.4             |
| 0.127                                                | 166.7            | 0.127             | 166.7            | 0.127             | 55.6             |
| 0.127                                                | 250.0            | 0.127             | 125.0            | 0.127             | 45.5             |
| 0.127                                                | 250.0            | 0.127             | 125.0            | 0.127             | 83.3             |
| 0.127                                                | 500.0            | 0.127             | 166.7            | 0.127             | 166.7            |
| 0.063                                                | 500.0            | 0.127             | 500.0            | 0.127             | 33.3             |
| 0.191                                                | 125.0            | 0.127             | 83.3             | 0.254             | 38.5             |
| 0.063                                                | 250.0            | 0.127             | 250.0            | 0.127             | 71.4             |
| 0.063                                                | 250.0            | 0.127             | 500.0            | 0.127             | 45.5             |
| 0.063                                                | 250.0            | 0.127             | 83.3             | 0.127             | 83.3             |
| 0.127                                                | 166.7            | 0.127             | 250.0            | 0.127             | 83.3             |
| 0.127                                                | 166.7            | 0.127             | 125.0            | 0.127             | 100.0            |
| 0.127                                                | 500.0            | 0.127             | 250.0            | 0.127             | 83.3             |
| 0.063                                                | 166.7            | 0.127             | 125.0            | 0.127             | 23.8             |
| 0.063                                                | 500.0            | 0.127             | 250.0            | 0.127             | 71.4             |
| 0.063                                                | 500.0            | 0.127             | 250.0            | 0.127             | 83.3             |
| 0.127                                                | 500.0            | 0.127             | 100.0            | 0.127             | 50.0             |
| 0.063                                                | 500.0            | 0.127             | 166.7            | 0.127             | 166.7            |
| Anteproyecto Límite VPP (mm/s) $f < 4$ Hz = 0.6 mm/s |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4$ Hz = 50 mm/s  |                  |                   |                  |                   |                  |

| PUNTO 7 EM11 Edificio 69 ACP – Diurno                |                  |                   |                  |                   |                  |
|------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.318                                                | 9.1              | 0.254             | 8.1              | 0.572             | 3.7              |
| 0.127                                                | 83.3             | 0.127             | 62.5             | 0.254             | 4.3              |
| 0.254                                                | 10.9             | 0.191             | 29.4             | 0.699             | 3.0              |
| 0.254                                                | 11.4             | 0.254             | 27.8             | 0.445             | 9.4              |
| 0.318                                                | 10.0             | 0.254             | 14.3             | 0.572             | 6.3              |
| 0.191                                                | 7.6              | 0.191             | 10.0             | 0.445             | 3.9              |
| 0.254                                                | 13.9             | 0.254             | 9.4              | 0.572             | 3.4              |
| 0.127                                                | 71.4             | 0.127             | 250.0            | 0.191             | 8.8              |
| 0.191                                                | 12.8             | 0.127             | 166.7            | 0.254             | 4.7              |
| 0.127                                                | 62.5             | 0.127             | 71.4             | 0.191             | 9.4              |
| 0.254                                                | 9.3              | 0.191             | 7.5              | 0.635             | 4.0              |
| 0.127                                                | 71.4             | 0.127             | 83.3             | 0.254             | 4.3              |
| 0.254                                                | 9.8              | 0.191             | 33.3             | 0.445             | 3.6              |
| 0.127                                                | 125.0            | 0.127             | 71.4             | 0.191             | 9.3              |
| 0.254                                                | 13.2             | 0.191             | 26.3             | 0.381             | 6.8              |
| 0.191                                                | 8.5              | 0.254             | 8.9              | 0.953             | 3.7              |
| 0.254                                                | 16.1             | 0.191             | 12.8             | 0.445             | 7.5              |
| 0.127                                                | 100.0            | 0.127             | 125.0            | 0.318             | 4.2              |
| Anteproyecto Límite VPP (mm/s) $f < 4$ Hz = 0.6 mm/s |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4$ Hz = 50 mm/s  |                  |                   |                  |                   |                  |

| PUNTO 7 EM11 Edificio 69 ACP – Nocturno              |                  |                   |                  |                   |                  |
|------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.191                                                | 35.7             | 0.191             | 31.3             | 0.254             | 6.8              |
| 0.127                                                | 100.0            | 0.127             | 71.4             | 0.191             | 4.8              |
| 0.191                                                | 50.0             | 0.127             | 45.5             | 0.254             | 7.9              |
| 0.191                                                | 33.3             | 0.127             | 45.5             | 0.254             | 6.8              |
| 0.127                                                | 71.4             | 0.127             | 250.0            | 0.254             | 7.2              |
| 0.191                                                | 12.5             | 0.127             | 250.0            | 0.254             | 7.5              |
| 0.318                                                | 10.4             | 0.191             | 12.5             | 0.381             | 8.3              |
| 0.127                                                | 250.0            | 0.127             | 83.3             | 0.254             | 5.2              |
| 0.254                                                | 16.1             | 0.191             | 29.4             | 0.445             | 7.8              |
| 0.191                                                | 17.2             | 0.127             | 83.3             | 0.254             | 10.6             |
| 0.127                                                | 166.7            | 0.127             | 250.0            | 0.127             | 62.5             |
| 0.127                                                | 62.5             | 0.127             | 100.0            | 0.191             | 8.8              |
| 0.191                                                | 18.5             | 0.191             | 26.3             | 0.318             | 10.0             |
| 0.127                                                | 250.0            | 0.127             | 62.5             | 0.127             | 11.4             |
| 0.191                                                | 13.2             | 0.127             | 83.3             | 0.318             | 8.9              |
| 0.254                                                | 12.2             | 0.191             | 12.5             | 0.381             | 8.9              |
| 0.127                                                | 166.7            | 0.127             | 250.0            | 0.191             | 21.7             |
| 0.127                                                | 83.3             | 0.127             | 166.7            | 0.318             | 8.2              |
| Anteproyecto Límite VPP (mm/s) $f < 4$ Hz = 0.6 mm/s |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4$ Hz = 50 mm/s  |                  |                   |                  |                   |                  |

| PUNTO 8 EM8C Fundación Nueva Vida (Hogar de Ancianos) - Diurno       |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.5              | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                 | 166.7            | 0.13              | 100.0            | 0.13              | 83.3             |
| 0.06                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 125.0            |
| 0.13                                                                 | 166.7            | 0.13              | 125.0            | 0.13              | 83.3             |
| 0.06                                                                 | 250.0            | 0.13              | 100.0            | 0.13              | 100.0            |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 71.4             |
| 0.06                                                                 | 500.0            | 0.06              | 83.3             | 0.13              | 83.3             |
| 0.13                                                                 | 250.0            | 0.13              | 100.0            | 0.13              | 83.3             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 27.8             |
| 0.13                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 41.7             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 21.7             |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 71.4             |
| 0.06                                                                 | 500.0            | 0.13              | 100.0            | 0.13              | 62.5             |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 83.3             |
| 0.06                                                                 | 166.7            | 0.13              | 100.0            | 0.13              | 62.5             |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 62.5             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 62.5             |
| 0.06                                                                 | 500.0            | 0.13              | 100.0            | 0.13              | 100.0            |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 8 EM8C Fundación Nueva Vida (Hogar de Ancianos) - Nocturno     |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.25                                                                 | 100.0            | 0.25              | 83.3             | 0.19              | 45.5             |
| 0.13                                                                 | 250.0            | 0.13              | 83.3             | 0.13              | 125.0            |
| 0.13                                                                 | 500.0            | 0.13              | 500.0            | 0.13              | 83.3             |
| 0.13                                                                 | 166.7            | 0.06              | 250.0            | 0.13              | 35.7             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 71.4             |
| 0.06                                                                 | 125.0            | 0.13              | 250.0            | 0.13              | 71.4             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 62.5             |
| 0.06                                                                 | 500.0            | 0.13              | 71.4             | 0.13              | 45.5             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 50.0             |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.06                                                                 | 166.7            | 0.13              | 250.0            | 0.13              | 71.4             |
| 0.13                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 71.4             |
| 0.06                                                                 | 166.7            | 0.06              | 250.0            | 0.13              | 71.4             |
| 0.06                                                                 | 500.0            | 0.13              | 125.0            | 0.13              | 100.0            |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 83.3             |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 125.0            |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 100.0            |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 9 EM8D Fundación Nueva Vida (Guardería) - Diurno               |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.19              | 1.4              | 0.13              | 71.4             |
| 0.06                                                                 | 250.0            | 0.13              | 83.3             | 0.13              | 62.5             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 71.4             |
| 0.13                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 38.5             |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 83.3             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 50.0             |
| 0.13                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 55.6             |
| 0.06                                                                 | 500.0            | 0.13              | 100.0            | 0.13              | 100.0            |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 31.3             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 27.8             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 55.6             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 166.7            |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 125.0            |
| 0.13                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 50.0             |
| 0.06                                                                 | 500.0            | 0.13              | 125.0            | 0.13              | 83.3             |
| 0.13                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 55.6             |
| 0.13                                                                 | 166.7            | 0.13              | 250.0            | 0.13              | 100.0            |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 9 EM8D Fundación Nueva Vida (Guardería) - Nocturno             |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 5.5              | 0.19              | 1.0              | 0.13              | 62.5             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 71.4             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.13                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 29.4             |
| 0.13                                                                 | 166.7            | 0.13              | 500.0            | 0.13              | 71.4             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 35.7             |
| 0.13                                                                 | 500.0            | 0.13              | 100.0            | 0.13              | 71.4             |
| 0.06                                                                 | 250.0            | 0.06              | 500.0            | 0.13              | 100.0            |
| 0.06                                                                 | 166.7            | 0.13              | 250.0            | 0.13              | 100.0            |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 83.3             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 71.4             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 250.0            |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 38.5             |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 71.4             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 250.0            |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 45.5             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 55.6             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 166.7            |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 10 EM8B Sitio de Disposición Farfán (Campamento 4K+600) - Diurno |                  |                   |                  |                   |                  |
|------------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                      | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                           |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                   | 0.4              | 0.19              | 0.6              | 0.13              | 125.0            |
| 0.13                                                                   | 166.7            | 0.13              | 166.7            | 0.13              | 55.6             |
| 0.13                                                                   | 500.0            | 0.13              | 125.0            | 0.13              | 125.0            |
| 0.13                                                                   | 250.0            | 0.13              | 166.7            | 0.13              | 55.6             |
| 0.13                                                                   | 166.7            | 0.13              | 125.0            | 0.13              | 166.7            |
| 0.06                                                                   | 250.0            | 0.13              | 166.7            | 0.13              | 41.7             |
| 0.06                                                                   | 500.0            | 0.13              | 166.7            | 0.13              | 62.5             |
| 0.13                                                                   | 250.0            | 0.25              | 166.7            | 0.13              | 100.0            |
| 0.06                                                                   | 500.0            | 0.13              | 250.0            | 0.13              | 71.4             |
| 0.06                                                                   | 500.0            | 0.13              | 250.0            | 0.13              | 26.3             |
| 0.06                                                                   | 500.0            | 0.13              | 166.7            | 0.13              | 250.0            |
| 0.06                                                                   | 250.0            | 0.13              | 250.0            | 0.13              | 83.3             |
| 0.13                                                                   | 250.0            | 0.13              | 166.7            | 0.13              | 71.4             |
| 0.06                                                                   | 500.0            | 0.13              | 250.0            | 0.13              | 20.8             |
| 0.06                                                                   | 250.0            | 0.13              | 100.0            | 0.13              | 166.7            |
| 0.13                                                                   | 500.0            | 0.13              | 166.7            | 0.13              | 29.4             |
| 0.13                                                                   | 500.0            | 0.13              | 166.7            | 0.13              | 31.3             |
| 0.06                                                                   | 250.0            | 0.13              | 166.7            | 0.13              | 29.4             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$   |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$    |                  |                   |                  |                   |                  |

| PUNTO 10 EM8B Sitio de Disposición Farfán (Campamento 4K+600) - Nocturno |                  |                   |                  |                   |                  |
|--------------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                        | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                             |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                     | 0.9              | 0.19              | 1.4              | 0.13              | 22.7             |
| 0.13                                                                     | 250.0            | 0.06              | 250.0            | 0.13              | 35.7             |
| 0.13                                                                     | 250.0            | 0.13              | 250.0            | 0.13              | 55.6             |
| 0.06                                                                     | 250.0            | 0.13              | 250.0            | 0.13              | 100.0            |
| 0.06                                                                     | 250.0            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.06                                                                     | 250.0            | 0.13              | 125.0            | 0.13              | 100.0            |
| 0.13                                                                     | 166.7            | 0.06              | 500.0            | 0.13              | 71.4             |
| 0.06                                                                     | 250.0            | 0.13              | 250.0            | 0.13              | 125.0            |
| 0.06                                                                     | 250.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                     | 250.0            | 0.06              | 166.7            | 0.13              | 71.4             |
| 0.06                                                                     | 500.0            | 0.13              | 71.4             | 0.13              | 100.0            |
| 0.06                                                                     | 166.7            | 0.06              | 500.0            | 0.13              | 71.4             |
| 0.06                                                                     | 250.0            | 0.13              | 125.0            | 0.13              | 55.6             |
| 0.06                                                                     | 500.0            | 0.13              | 166.7            | 0.13              | 71.4             |
| 0.06                                                                     | 250.0            | 0.06              | 500.0            | 0.13              | 71.4             |
| 0.06                                                                     | 166.7            | 0.13              | 125.0            | 0.13              | 71.4             |
| 0.06                                                                     | 500.0            | 0.06              | 250.0            | 0.13              | 62.5             |
| 0.13                                                                     | 500.0            | 0.13              | 250.0            | 0.13              | 83.3             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$     |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$      |                  |                   |                  |                   |                  |

**RESULTADOS FÍN DE SEMANA**

| PUNTO 1 EM17A Urbanización Rainforest Village - Diurno               |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.13              | 166.7            | 0.13              | 41.7             |
| 0.13                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 41.7             |
| 0.13                                                                 | 100.0            | 0.13              | 166.7            | 0.13              | 29.4             |
| 0.13                                                                 | 125.0            | 0.13              | 166.7            | 0.13              | 33.3             |
| 0.13                                                                 | 125.0            | 0.13              | 166.7            | 0.13              | 22.7             |
| 0.13                                                                 | 125.0            | 0.13              | 125.0            | 0.13              | 45.5             |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 71.4             |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 100.0            |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 62.5             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 21.7             |
| 0.13                                                                 | 250.0            | 0.13              | 100.0            | 0.13              | 35.7             |
| 0.13                                                                 | 166.7            | 0.13              | 71.4             | 0.13              | 31.3             |
| 0.13                                                                 | 125.0            | 0.13              | 125.0            | 0.13              | 41.7             |
| 0.13                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 45.5             |
| 0.13                                                                 | 166.7            | 0.13              | 125.0            | 0.13              | 21.7             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 250.0            |
| 0.13                                                                 | 250.0            | 0.13              | 83.3             | 0.13              | 71.4             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 1 EM17A Urbanización Rainforest Village - Nocturno |                  |                   |                  |                   |                  |
|----------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                        | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                             |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                     | 0.4              | 0.13              | 166.7            | 0.13              | 62.5             |
| 0.13                                                     | 250.0            | 0.13              | 166.7            | 0.13              | 33.3             |
| 0.13                                                     | 250.0            | 0.13              | 100.0            | 0.13              | 125.0            |
| 0.13                                                     | 500.0            | 0.13              | 125.0            | 0.13              | 100.0            |
| 0.06                                                     | 166.7            | 0.13              | 250.0            | 0.13              | 83.3             |
| 0.06                                                     | 166.7            | 0.13              | 125.0            | 0.13              | 55.6             |
| 0.13                                                     | 250.0            | 0.06              | 250.0            | 0.13              | 83.3             |
| 0.06                                                     | 500.0            | 0.13              | 166.7            | 0.13              | 41.7             |
| 0.06                                                     | 250.0            | 0.13              | 166.7            | 0.13              | 125.0            |
| 0.06                                                     | 500.0            | 0.13              | 125.0            | 0.13              | 125.0            |
| 0.06                                                     | 250.0            | 0.13              | 250.0            | 0.13              | 100.0            |
| 0.06                                                     | 250.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.13                                                     | 250.0            | 0.13              | 166.7            | 0.13              | 33.3             |
| 0.06                                                     | 250.0            | 0.06              | 166.7            | 0.13              | 38.5             |
| 0.13                                                     | 166.7            | 0.13              | 166.7            | 0.13              | 55.6             |
| 0.06                                                     | 500.0            | 0.13              | 125.0            | 0.13              | 166.7            |
| 0.06                                                     | 500.0            | 0.13              | 166.7            | 0.13              | 62.5             |
| 0.13                                                     | 500.0            | 0.13              | 125.0            | 0.13              | 83.3             |
| Anteproyecto Límite VPP (mm/s) $f < 4$ Hz = 0.6 mm/s     |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4$ Hz = 50 mm/s      |                  |                   |                  |                   |                  |

| PUNTO 2 EM9 PPC – Diurno                                             |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.13              | 62.5             | 0.13              | 55.6             |
| 0.13                                                                 | 166.7            | 0.13              | 125.0            | 0.13              | 41.7             |
| 0.13                                                                 | 166.7            | 0.13              | 100.0            | 0.13              | 21.7             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 55.6             |
| 0.06                                                                 | 250.0            | 0.13              | 83.3             | 0.13              | 100.0            |
| 0.06                                                                 | 166.7            | 0.13              | 125.0            | 0.13              | 50.0             |
| 0.13                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 100.0            |
| 0.13                                                                 | 250.0            | 0.13              | 55.6             | 0.13              | 83.3             |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 62.5             |
| 0.19                                                                 | 100.0            | 0.13              | 83.3             | 0.13              | 38.5             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 31.3             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 26.3             |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 100.0            |
| 0.06                                                                 | 166.7            | 0.13              | 125.0            | 0.13              | 26.3             |
| 0.13                                                                 | 166.7            | 0.13              | 500.0            | 0.13              | 100.0            |
| 0.13                                                                 | 500.0            | 0.13              | 250.0            | 0.19              | 26.3             |
| 0.25                                                                 | 83.3             | 0.19              | 83.3             | 0.13              | 71.4             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 2 EM9 PPC – Nocturno                                           |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.19              | 0.7              | 0.19              | 0.7              |
| 0.13                                                                 | 250.0            | 0.13              | 71.4             | 0.13              | 100.0            |
| 0.13                                                                 | 166.7            | 0.13              | 250.0            | 0.13              | 29.4             |
| 0.25                                                                 | 50.0             | 0.25              | 62.5             | 0.38              | 35.7             |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 62.5             |
| 0.19                                                                 | 35.7             | 0.13              | 250.0            | 0.32              | 29.4             |
| 0.13                                                                 | 166.7            | 0.13              | 125.0            | 0.25              | 41.7             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 166.7            |
| 0.06                                                                 | 250.0            | 0.06              | 250.0            | 0.13              | 71.4             |
| 0.06                                                                 | 250.0            | 0.06              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 35.7             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 125.0            |
| 0.06                                                                 | 166.7            | 0.13              | 100.0            | 0.13              | 71.4             |
| 0.19                                                                 | 125.0            | 0.13              | 125.0            | 0.19              | 50.0             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 35.7             |
| 0.06                                                                 | 500.0            | 0.06              | 250.0            | 0.13              | 250.0            |
| 0.13                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 38.5             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 3 EM12 Pegado a la cerca de Panamá Railway Company - Diurno |                  |                   |                  |                   |                  |
|-------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                 | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                      |                  | Transversal       |                  | Vertical          |                  |
| 0.44                                                              | 11.1             | 0.38              | 8.9              | 0.95              | 9.1              |
| 0.38                                                              | 11.1             | 0.25              | 11.4             | 0.57              | 9.8              |
| 0.25                                                              | 9.4              | 0.19              | 9.8              | 0.64              | 7.7              |
| 0.25                                                              | 9.4              | 0.32              | 10.4             | 0.76              | 9.6              |
| 0.38                                                              | 9.8              | 0.25              | 9.3              | 0.57              | 8.8              |
| 0.38                                                              | 9.8              | 0.25              | 7.7              | 0.70              | 9.3              |
| 0.32                                                              | 9.6              | 0.38              | 10.6             | 0.83              | 7.6              |
| 0.32                                                              | 11.1             | 0.25              | 8.9              | 0.83              | 3.5              |
| 0.32                                                              | 11.1             | 0.38              | 11.1             | 1.02              | 7.2              |
| 0.32                                                              | 8.3              | 0.32              | 9.8              | 0.83              | 7.1              |
| 0.32                                                              | 9.4              | 0.32              | 11.4             | 0.83              | 2.9              |
| 0.32                                                              | 12.2             | 0.25              | 11.9             | 0.70              | 9.3              |
| 0.32                                                              | 10.2             | 0.25              | 9.4              | 0.64              | 8.9              |
| 0.32                                                              | 10.0             | 0.19              | 12.2             | 0.51              | 8.5              |
| 0.19                                                              | 10.0             | 0.19              | 12.5             | 0.51              | 7.1              |
| 0.57                                                              | 9.6              | 0.38              | 10.2             | 0.89              | 8.2              |
| 0.25                                                              | 11.6             | 0.25              | 9.3              | 0.83              | 3.5              |
| 0.19                                                              | 12.5             | 0.25              | 11.9             | 0.64              | 8.1              |
| Anteproyecto Límite VPP (mm/s) $f < 4$ Hz = 0.6 mm/s              |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4$ Hz = 50 mm/s               |                  |                   |                  |                   |                  |

| PUNTO 3 EM12 Pegado a la cerca de Panamá Railway Company - Nocturno  |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.38                                                                 | 10.2             | 0.19              | 2.1              | 0.64              | 8.6              |
| 0.44                                                                 | 9.4              | 0.38              | 10.9             | 0.76              | 4.3              |
| 0.19                                                                 | 12.8             | 0.25              | 10.9             | 0.44              | 9.6              |
| 0.19                                                                 | 4.3              | 0.19              | 8.3              | 0.44              | 5.6              |
| 0.25                                                                 | 12.8             | 0.25              | 10.9             | 0.76              | 4.5              |
| 0.25                                                                 | 9.8              | 0.25              | 9.6              | 0.70              | 7.1              |
| 0.19                                                                 | 16.1             | 0.38              | 9.6              | 0.89              | 8.5              |
| 0.32                                                                 | 8.3              | 0.32              | 10.4             | 0.83              | 7.8              |
| 0.38                                                                 | 9.8              | 0.32              | 9.4              | 0.95              | 6.6              |
| 0.13                                                                 | 55.6             | 0.19              | 11.1             | 0.51              | 7.6              |
| 0.32                                                                 | 9.8              | 0.38              | 9.3              | 0.89              | 8.3              |
| 0.25                                                                 | 9.8              | 0.25              | 9.8              | 0.70              | 8.3              |
| 0.38                                                                 | 12.8             | 0.38              | 10.6             | 1.21              | 7.9              |
| 0.32                                                                 | 8.2              | 0.32              | 9.1              | 0.83              | 7.7              |
| 0.57                                                                 | 3.9              | 0.38              | 4.6              | 1.71              | 2.9              |
| 0.44                                                                 | 10.4             | 0.44              | 6.8              | 1.33              | 5.2              |
| 0.13                                                                 | 500.0            | 0.25              | 9.4              | 0.44              | 6.8              |
| 0.19                                                                 | 11.1             | 0.19              | 8.5              | 0.51              | 6.4              |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 4 EM1B Campamento Oeste 5k+800 - Diurno                        |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.19              | 0.9              | 0.13              | 50.0             |
| 0.13                                                                 | 500.0            | 0.13              | 100.0            | 0.13              | 125.0            |
| 0.13                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 41.7             |
| 0.13                                                                 | 166.7            | 0.13              | 250.0            | 0.13              | 62.5             |
| 0.13                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 100.0            |
| 0.13                                                                 | 166.7            | 0.13              | 100.0            | 0.13              | 38.5             |
| 0.06                                                                 | 166.7            | 0.13              | 250.0            | 0.13              | 21.7             |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 71.4             |
| 0.06                                                                 | 250.0            | 0.13              | 83.3             | 0.13              | 45.5             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                 | 166.7            | 0.13              | 125.0            | 0.13              | 62.5             |
| 0.13                                                                 | 125.0            | 0.13              | 250.0            | 0.13              | 29.4             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 15.6             |
| 0.06                                                                 | 250.0            | 0.13              | 100.0            | 0.13              | 33.3             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 45.5             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 35.7             |
| 0.06                                                                 | 500.0            | 0.13              | 125.0            | 0.13              | 166.7            |
| 0.06                                                                 | 500.0            | 0.13              | 71.4             | 0.13              | 100.0            |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 4 EM1B Campamento Oeste 5k+800 - Nocturno                      |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.32                                                                 | 10.0             | 0.19              | 11.9             | 0.44              | 8.8              |
| 0.25                                                                 | 13.5             | 0.19              | 13.2             | 0.44              | 10.6             |
| 0.51                                                                 | 10.6             | 0.44              | 9.8              | 1.02              | 8.8              |
| 0.70                                                                 | 10.4             | 0.19              | 10.0             | 0.89              | 9.8              |
| 0.25                                                                 | 13.9             | 0.13              | 166.7            | 0.32              | 9.4              |
| 0.44                                                                 | 12.2             | 0.19              | 13.9             | 0.64              | 10.9             |
| 0.32                                                                 | 10.9             | 0.19              | 10.6             | 0.51              | 9.1              |
| 0.38                                                                 | 11.1             | 0.25              | 11.1             | 0.57              | 9.4              |
| 0.25                                                                 | 9.6              | 0.13              | 13.9             | 0.32              | 8.2              |
| 0.25                                                                 | 9.1              | 0.13              | 71.4             | 0.25              | 9.4              |
| 0.44                                                                 | 11.1             | 0.19              | 13.2             | 0.70              | 10.6             |
| 0.25                                                                 | 11.1             | 0.19              | 11.4             | 0.38              | 10.4             |
| 0.38                                                                 | 10.9             | 0.19              | 13.2             | 0.57              | 10.6             |
| 0.19                                                                 | 11.9             | 0.19              | 13.2             | 0.32              | 9.6              |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 18.5             |
| 0.32                                                                 | 9.6              | 0.19              | 11.9             | 0.38              | 9.3              |
| 0.25                                                                 | 9.3              | 0.19              | 10.0             | 0.38              | 8.5              |
| 0.19                                                                 | 13.2             | 0.19              | 11.6             | 0.44              | 10.2             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 5 EM6 Campamento Oeste 5k+200 - Diurno                         |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.13              | 125.0            | 0.13              | 71.4             |
| 0.13                                                                 | 166.7            | 0.13              | 125.0            | 0.13              | 62.5             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.13                                                                 | 166.7            | 0.13              | 250.0            | 0.13              | 125.0            |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 100.0            |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 22.7             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 31.3             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 33.3             |
| 0.13                                                                 | 125.0            | 0.13              | 166.7            | 0.13              | 62.5             |
| 0.06                                                                 | 250.0            | 0.13              | 71.4             | 0.13              | 83.3             |
| 0.13                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 166.7            |
| 0.13                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 62.5             |
| 0.06                                                                 | 166.7            | 0.13              | 83.3             | 0.13              | 55.6             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 38.5             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 125.0            |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 125.0            |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 55.6             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 20.8             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 5 EM6 Campamento Oeste 5k+200 - Nocturno       |                  |                   |                  |                   |                  |
|------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.32                                                 | 3.4              | 0.19              | 31.3             | 0.19              | 1.5              |
| 0.19                                                 | 16.1             | 0.19              | 17.2             | 0.13              | 125.0            |
| 0.13                                                 | 166.7            | 0.19              | 16.7             | 0.13              | 250.0            |
| 0.13                                                 | 62.5             | 0.13              | 27.8             | 0.13              | 31.3             |
| 0.13                                                 | 500.0            | 0.25              | 13.5             | 0.13              | 41.7             |
| 0.13                                                 | 62.5             | 0.19              | 14.7             | 0.13              | 45.5             |
| 0.13                                                 | 38.5             | 0.19              | 12.5             | 0.13              | 71.4             |
| 0.13                                                 | 83.3             | 0.19              | 12.2             | 0.13              | 250.0            |
| 0.13                                                 | 100.0            | 0.19              | 15.2             | 0.13              | 35.7             |
| 0.13                                                 | 250.0            | 0.25              | 10.2             | 0.13              | 83.3             |
| 0.13                                                 | 71.4             | 0.19              | 38.5             | 0.13              | 100.0            |
| 0.13                                                 | 500.0            | 0.19              | 13.5             | 0.13              | 71.4             |
| 0.13                                                 | 55.6             | 0.25              | 13.5             | 0.13              | 50.0             |
| 0.13                                                 | 100.0            | 0.19              | 41.7             | 0.13              | 45.5             |
| 0.13                                                 | 38.5             | 0.19              | 15.6             | 0.32              | 125.0            |
| 0.13                                                 | 100.0            | 0.19              | 13.2             | 0.19              | 125.0            |
| 0.13                                                 | 100.0            | 0.13              | 500.0            | 0.13              | 71.4             |
| 0.13                                                 | 83.3             | 0.19              | 16.7             | 0.13              | 62.5             |
| Anteproyecto Límite VPP (mm/s) $f < 4$ Hz = 0.6 mm/s |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4$ Hz = 50 mm/s  |                  |                   |                  |                   |                  |

| PUNTO 6 EM13 Policía Nacional – Diurno                               |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.25                                                                 | 10.9             | 0.19              | 11.9             | 0.32              | 9.3              |
| 0.19                                                                 | 13.5             | 0.13              | 166.7            | 0.32              | 9.8              |
| 0.25                                                                 | 10.6             | 0.13              | 33.3             | 0.32              | 8.3              |
| 0.32                                                                 | 11.4             | 0.19              | 13.2             | 0.32              | 10.6             |
| 0.13                                                                 | 31.3             | 0.13              | 83.3             | 0.25              | 8.3              |
| 0.32                                                                 | 9.8              | 0.19              | 19.2             | 0.38              | 10.6             |
| 0.25                                                                 | 11.4             | 0.19              | 13.2             | 0.32              | 11.6             |
| 0.19                                                                 | 10.9             | 0.19              | 13.2             | 0.38              | 8.8              |
| 0.25                                                                 | 12.2             | 0.19              | 11.9             | 0.32              | 9.6              |
| 0.38                                                                 | 10.9             | 0.19              | 10.4             | 0.44              | 9.6              |
| 0.32                                                                 | 10.9             | 0.19              | 12.8             | 0.38              | 9.3              |
| 0.32                                                                 | 10.9             | 0.25              | 12.2             | 0.38              | 8.2              |
| 0.38                                                                 | 10.6             | 0.19              | 10.2             | 0.51              | 8.9              |
| 0.32                                                                 | 13.9             | 0.19              | 11.9             | 0.51              | 10.2             |
| 0.19                                                                 | 13.9             | 0.19              | 11.6             | 0.32              | 8.5              |
| 0.38                                                                 | 12.2             | 0.19              | 15.2             | 0.64              | 8.6              |
| 0.32                                                                 | 10.6             | 0.25              | 12.2             | 0.57              | 9.4              |
| 0.32                                                                 | 11.9             | 0.25              | 11.1             | 0.51              | 8.8              |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 6 EM13 Policía Nacional – Nocturno                             |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.19              | 0.6              | 0.13              | 25.0             |
| 0.13                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 100.0            |
| 0.13                                                                 | 166.7            | 0.13              | 100.0            | 0.32              | 166.7            |
| 0.13                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 31.3             |
| 0.06                                                                 | 250.0            | 0.13              | 100.0            | 0.13              | 62.5             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 83.3             |
| 0.13                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 71.4             |
| 0.06                                                                 | 250.0            | 0.13              | 500.0            | 0.13              | 62.5             |
| 0.06                                                                 | 500.0            | 0.06              | 166.7            | 0.19              | 100.0            |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 55.6             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 35.7             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 71.4             |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 33.3             |
| 0.06                                                                 | 250.0            | 0.13              | 83.3             | 0.13              | 35.7             |
| 0.13                                                                 | 166.7            | 0.13              | 500.0            | 0.13              | 38.5             |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 45.5             |
| 0.06                                                                 | 500.0            | 0.13              | 500.0            | 0.13              | 71.4             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 7 EM11 Edificio 69 ACP – Diurno                                |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 1.905                                                                | 250.0            | 1.207             | 166.7            | 0.508             | 9.1              |
| 0.127                                                                | 125.0            | 0.127             | 100.0            | 0.191             | 13.5             |
| 0.254                                                                | 26.3             | 0.191             | 35.7             | 0.508             | 3.7              |
| 0.127                                                                | 166.7            | 0.127             | 62.5             | 0.127             | 9.8              |
| 0.191                                                                | 10.2             | 0.191             | 10.2             | 0.508             | 7.2              |
| 0.254                                                                | 125.0            | 0.191             | 100.0            | 0.381             | 3.5              |
| 0.318                                                                | 9.8              | 0.254             | 12.8             | 0.826             | 4.4              |
| 0.254                                                                | 11.4             | 0.127             | 125.0            | 0.318             | 7.2              |
| 0.254                                                                | 45.5             | 0.127             | 125.0            | 0.318             | 3.1              |
| 0.191                                                                | 38.5             | 0.127             | 55.6             | 0.318             | 5.8              |
| 0.254                                                                | 16.7             | 0.191             | 9.4              | 0.508             | 9.6              |
| 0.127                                                                | 125.0            | 0.127             | 125.0            | 0.191             | 3.8              |
| 0.127                                                                | 50.0             | 0.127             | 33.3             | 0.254             | 5.3              |
| 0.254                                                                | 10.2             | 0.191             | 26.3             | 0.445             | 8.1              |
| 0.191                                                                | 20.8             | 0.127             | 62.5             | 0.318             | 7.6              |
| 0.127                                                                | 100.0            | 0.127             | 62.5             | 0.318             | 3.6              |
| 0.191                                                                | 17.2             | 0.191             | 17.9             | 0.318             | 6.8              |
| 0.127                                                                | 100.0            | 0.127             | 500.0            | 0.127             | 6.8              |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 7 EM11 Edificio 69 ACP – Nocturno                              |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.191                                                                | 0.5              | 0.191             | 3.7              | 0.191             | 8.3              |
| 0.191                                                                | 27.8             | 0.191             | 41.7             | 0.318             | 11.4             |
| 0.127                                                                | 250.0            | 0.127             | 100.0            | 0.127             | 33.3             |
| 0.191                                                                | 27.8             | 0.127             | 166.7            | 0.254             | 8.6              |
| 0.254                                                                | 15.2             | 0.191             | 25.0             | 0.318             | 9.3              |
| 0.063                                                                | 500.0            | 0.127             | 100.0            | 0.191             | 5.2              |
| 0.127                                                                | 55.6             | 0.127             | 71.4             | 0.191             | 6.0              |
| 0.127                                                                | 38.5             | 0.127             | 166.7            | 0.191             | 12.2             |
| 0.127                                                                | 125.0            | 0.127             | 166.7            | 0.191             | 5.1              |
| 0.127                                                                | 100.0            | 0.127             | 166.7            | 0.191             | 5.4              |
| 0.127                                                                | 71.4             | 0.127             | 500.0            | 0.191             | 5.9              |
| 0.191                                                                | 35.7             | 0.127             | 62.5             | 0.191             | 55.6             |
| 0.063                                                                | 500.0            | 0.127             | 125.0            | 0.127             | 13.9             |
| 0.127                                                                | 500.0            | 0.127             | 500.0            | 0.191             | 50.0             |
| 0.191                                                                | 29.4             | 0.191             | 41.7             | 0.254             | 35.7             |
| 0.127                                                                | 29.4             | 0.127             | 166.7            | 0.191             | 9.8              |
| 0.254                                                                | 14.3             | 0.191             | 29.4             | 0.381             | 11.1             |
| 0.127                                                                | 500.0            | 0.127             | 500.0            | 0.191             | 8.9              |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 8 EM8C Fundación Nueva Vida (Hogar de Ancianos) - Diurno       |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.19              | 1.1              | 0.13              | 71.4             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 125.0            |
| 0.13                                                                 | 166.7            | 0.13              | 500.0            | 0.13              | 100.0            |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 62.5             |
| 0.06                                                                 | 500.0            | 0.13              | 500.0            | 0.13              | 29.4             |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 55.6             |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.06                                                                 | 500.0            | 0.06              | 250.0            | 0.13              | 83.3             |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.13                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 71.4             |
| 0.13                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 71.4             |
| 0.06                                                                 | 250.0            | 0.13              | 500.0            | 0.13              | 71.4             |
| 0.13                                                                 | 166.7            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.13                                                                 | 500.0            | 0.06              | 250.0            | 0.13              | 71.4             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 55.6             |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 31.3             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 8 EM8C Fundación Nueva Vida (Hogar de Ancianos) - Nocturno     |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.5              | 0.19              | 0.7              | 0.13              | 29.4             |
| 0.13                                                                 | 500.0            | 0.13              | 125.0            | 0.13              | 166.7            |
| 0.13                                                                 | 166.7            | 0.06              | 250.0            | 0.13              | 62.5             |
| 0.13                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 71.4             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 83.3             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 83.3             |
| 0.06                                                                 | 500.0            | 0.06              | 250.0            | 0.13              | 71.4             |
| 0.06                                                                 | 500.0            | 0.06              | 250.0            | 0.13              | 83.3             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 50.0             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.06                                                                 | 500.0            | 0.13              | 125.0            | 0.13              | 125.0            |
| 0.13                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 35.7             |
| 0.06                                                                 | 250.0            | 0.13              | 125.0            | 0.13              | 35.7             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 125.0            |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 125.0            |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 38.5             |
| 0.13                                                                 | 166.7            | 0.13              | 250.0            | 0.13              | 125.0            |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 83.3             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 9 EM8D Fundación Nueva Vida (Guardería) - Diurno               |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.19              | 0.7              | 0.13              | 83.3             |
| 0.13                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 125.0            |
| 0.06                                                                 | 500.0            | 0.06              | 125.0            | 0.13              | 62.5             |
| 0.13                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.06                                                                 | 500.0            | 0.13              | 100.0            | 0.13              | 125.0            |
| 0.06                                                                 | 125.0            | 0.13              | 166.7            | 0.13              | 166.7            |
| 0.13                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 125.0            |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 41.7             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 166.7            |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 38.5             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 62.5             |
| 0.06                                                                 | 500.0            | 0.13              | 500.0            | 0.13              | 83.3             |
| 0.13                                                                 | 100.0            | 0.13              | 250.0            | 0.13              | 166.7            |
| 0.13                                                                 | 166.7            | 0.13              | 100.0            | 0.13              | 100.0            |
| 0.06                                                                 | 500.0            | 0.06              | 250.0            | 0.13              | 50.0             |
| 0.13                                                                 | 125.0            | 0.13              | 250.0            | 0.13              | 50.0             |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 71.4             |
| 0.06                                                                 | 166.7            | 0.13              | 125.0            | 0.13              | 100.0            |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 9 EM8D Fundación Nueva Vida (Guardería) - Nocturno             |                  |                   |                  |                   |                  |
|----------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                    | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                         |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                 | 0.4              | 0.13              | 100.0            | 0.13              | 100.0            |
| 0.13                                                                 | 71.4             | 0.13              | 250.0            | 0.13              | 50.0             |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 71.4             |
| 0.13                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.13                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 71.4             |
| 0.06                                                                 | 500.0            | 0.13              | 250.0            | 0.13              | 100.0            |
| 0.06                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 22.7             |
| 0.06                                                                 | 250.0            | 0.13              | 71.4             | 0.13              | 71.4             |
| 0.06                                                                 | 166.7            | 0.13              | 250.0            | 0.13              | 31.3             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.06                                                                 | 250.0            | 0.13              | 166.7            | 0.13              | 166.7            |
| 0.06                                                                 | 166.7            | 0.13              | 250.0            | 0.13              | 166.7            |
| 0.13                                                                 | 500.0            | 0.13              | 166.7            | 0.13              | 55.6             |
| 0.06                                                                 | 500.0            | 0.13              | 125.0            | 0.13              | 166.7            |
| 0.06                                                                 | 250.0            | 0.13              | 250.0            | 0.13              | 35.7             |
| 0.06                                                                 | 500.0            | 0.13              | 500.0            | 0.13              | 71.4             |
| 0.06                                                                 | 500.0            | 0.06              | 250.0            | 0.13              | 83.3             |
| 0.06                                                                 | 500.0            | 0.13              | 125.0            | 0.13              | 83.3             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$ |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$  |                  |                   |                  |                   |                  |

| PUNTO 10 EM8B Sitio de Disposición Farfán (Campamento 4K+600) - Diurno |                  |                   |                  |                   |                  |
|------------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                      | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                           |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                   | 0.4              | 0.19              | 0.9              | 0.19              | 0.8              |
| 0.13                                                                   | 500.0            | 0.13              | 500.0            | 0.13              | 71.4             |
| 0.13                                                                   | 500.0            | 0.13              | 166.7            | 0.13              | 62.5             |
| 0.06                                                                   | 250.0            | 0.06              | 250.0            | 0.13              | 50.0             |
| 0.06                                                                   | 250.0            | 0.13              | 250.0            | 0.13              | 55.6             |
| 0.06                                                                   | 500.0            | 0.13              | 166.7            | 0.13              | 125.0            |
| 0.06                                                                   | 500.0            | 0.13              | 166.7            | 0.13              | 166.7            |
| 0.06                                                                   | 250.0            | 0.13              | 166.7            | 0.13              | 100.0            |
| 0.06                                                                   | 250.0            | 0.13              | 125.0            | 0.13              | 166.7            |
| 0.06                                                                   | 500.0            | 0.13              | 250.0            | 0.13              | 100.0            |
| 0.06                                                                   | 500.0            | 0.06              | 500.0            | 0.13              | 100.0            |
| 0.06                                                                   | 500.0            | 0.13              | 500.0            | 0.13              | 100.0            |
| 0.06                                                                   | 500.0            | 0.13              | 500.0            | 0.13              | 41.7             |
| 0.06                                                                   | 100.0            | 0.13              | 500.0            | 0.13              | 41.7             |
| 0.13                                                                   | 250.0            | 0.13              | 250.0            | 0.13              | 38.5             |
| 0.06                                                                   | 250.0            | 0.13              | 500.0            | 0.13              | 125.0            |
| 0.06                                                                   | 250.0            | 0.13              | 166.7            | 0.13              | 62.5             |
| 0.06                                                                   | 500.0            | 0.06              | 500.0            | 0.13              | 166.7            |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$   |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$    |                  |                   |                  |                   |                  |

| PUNTO 10 EM8B Sitio de Disposición Farfán (Campamento 4K+600) - Nocturno |                  |                   |                  |                   |                  |
|--------------------------------------------------------------------------|------------------|-------------------|------------------|-------------------|------------------|
| Velocidad<br>mm/s                                                        | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz | Velocidad<br>mm/s | Frecuencia<br>Hz |
| Longitudinal                                                             |                  | Transversal       |                  | Vertical          |                  |
| 0.19                                                                     | 0.4              | 0.19              | 0.8              | 0.13              | 62.5             |
| 0.13                                                                     | 250.0            | 0.13              | 71.4             | 0.13              | 83.3             |
| 0.13                                                                     | 250.0            | 0.06              | 166.7            | 0.13              | 83.3             |
| 0.13                                                                     | 250.0            | 0.13              | 250.0            | 0.13              | 55.6             |
| 0.06                                                                     | 500.0            | 0.13              | 250.0            | 0.13              | 250.0            |
| 0.13                                                                     | 500.0            | 0.13              | 125.0            | 0.13              | 83.3             |
| 0.06                                                                     | 250.0            | 0.13              | 250.0            | 0.13              | 71.4             |
| 0.06                                                                     | 250.0            | 0.13              | 166.7            | 0.13              | 62.5             |
| 0.06                                                                     | 125.0            | 0.13              | 125.0            | 0.13              | 71.4             |
| 0.13                                                                     | 166.7            | 0.13              | 166.7            | 0.13              | 50.0             |
| 0.06                                                                     | 250.0            | 0.06              | 250.0            | 0.13              | 166.7            |
| 0.06                                                                     | 250.0            | 0.13              | 250.0            | 0.13              | 125.0            |
| 0.06                                                                     | 500.0            | 0.13              | 500.0            | 0.13              | 83.3             |
| 0.13                                                                     | 250.0            | 0.13              | 250.0            | 0.13              | 33.3             |
| 0.06                                                                     | 250.0            | 0.06              | 166.7            | 0.13              | 100.0            |
| 0.06                                                                     | 500.0            | 0.13              | 166.7            | 0.13              | 83.3             |
| 0.06                                                                     | 500.0            | 0.13              | 100.0            | 0.13              | 83.3             |
| 0.13                                                                     | 500.0            | 0.13              | 125.0            | 0.13              | 83.3             |
| Anteproyecto Límite VPP (mm/s) $f < 4 \text{ Hz} = 0.6 \text{ mm/s}$     |                  |                   |                  |                   |                  |
| Anteproyecto Límite VPP (mm/s) $f > 4 \text{ Hz} = 50 \text{ mm/s}$      |                  |                   |                  |                   |                  |

**CONCLUSIONES**

En base a los resultados obtenidos se puede concluir, que los niveles de vibraciones ambientales existentes, presentan niveles en cumplimiento con el anteproyecto Vibraciones Ambientales Panamá.

De igual forma los monitoreos realizados cumplen con las directrices para el procedimiento y evaluación de las vibraciones, establecidos en las normas aplicables Anteproyecto de Vibraciones Ambientales de Panamá, UNE 22381:1993, USBM RI8507.

Actualmente las únicas actividades que pueden generar vibraciones, son las que se desarrollan en las áreas de estudio y que fueron descritas en el cuadro de estaciones de monitoreo, las mismas corresponden a eventos de origen antropogénicos.

|                                        |                                         |                                         |
|----------------------------------------|-----------------------------------------|-----------------------------------------|
| <b>Elaborado por:</b><br>Noel Palacios | <b>Revisado por:</b><br>Alcides Vásquez | <b>Aprobado por:</b><br>Alcides Vásquez |
|----------------------------------------|-----------------------------------------|-----------------------------------------|

## ANEXOS

## CERTIFICADO DE CALIBRACIÓN



3728 4th Avenue South  
Birmingham, AL 35222-2420 USA  
www.nomis.com

205-592-2466  
USA Wats. 800- 749-2477  
Fax 205-592-2477  
Sales@nomis.com

### CERTIFICATE OF CALIBRATION

|                                     |                                      |
|-------------------------------------|--------------------------------------|
| <b>Customer:</b> Specialty PIPE     | <b>Record Number:</b> 22058-2215     |
| <b>Model:</b> 5400 X2G              | <b>Serial Number:</b> 2215           |
| <b>Transducer #:</b> 2215           | <b>Microphone #:</b> 2215            |
| <b>Date Calibrated:</b> 04 May 2021 | <b>Next Calibration:</b> 04 May 2022 |
| <b>Temperature:</b> 71 F            | <b>Relative Humidity:</b> 47 %       |

| Input  | Reading<br>Before Cal | Reading after<br>Cal | <u>Calibration Reference</u> |           |
|--------|-----------------------|----------------------|------------------------------|-----------|
|        |                       |                      | Level                        | Frequency |
| L axis | .4331v                | .4420v               | 1.00 ips                     | 50 Hz     |
| T axis | .4368v                | .4420v               | 1.00 ips                     | 50 Hz     |
| V axis | .4481v                | .4420v               | 1.00 ips                     | 50 Hz     |
| Sound  | 127 dBL               | 127 dBL              | 127 dBL                      | 30 Hz     |

above equipment has been calibrated using instrument s whose accuracies are traceable to the National Institute of Standards and technology ( NIST) and are supported by a calibration system which conforms are requirement of MIL-STD-45662A and meets ISO-9000 customer requirements.

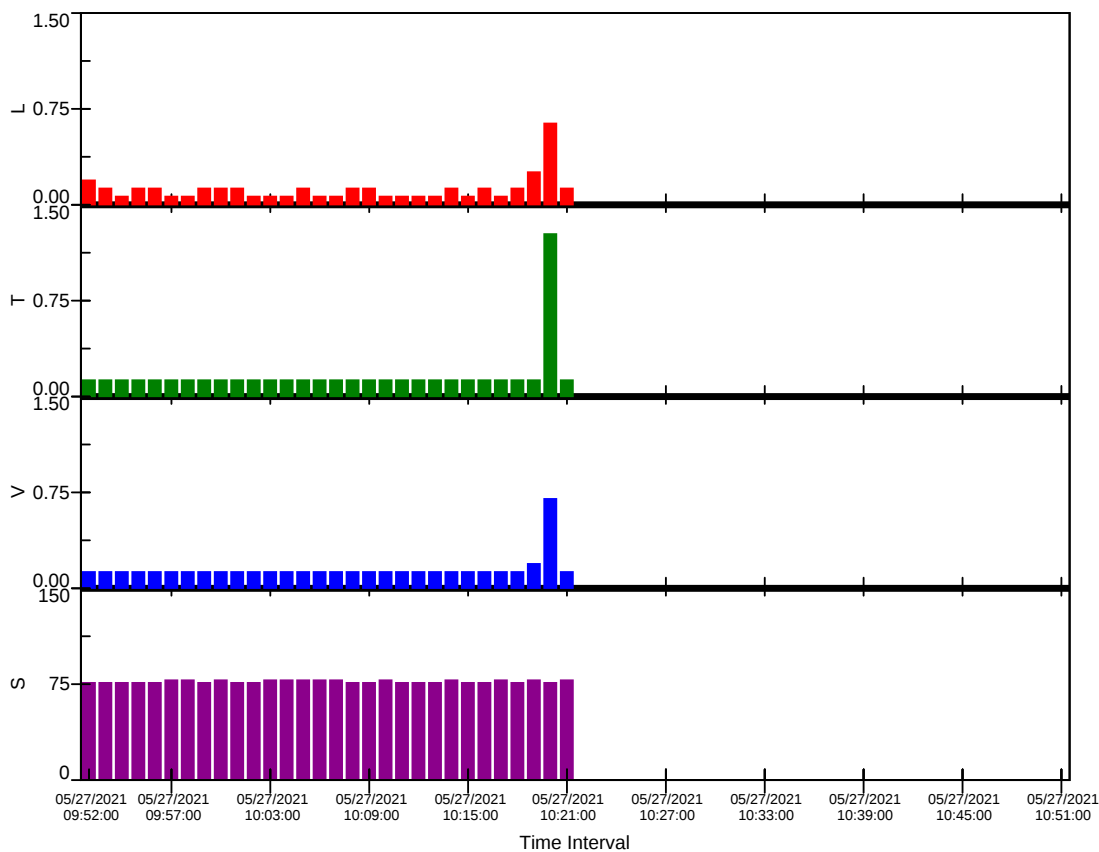
Signed by:  Date: 04 May 2022  
James carter

**GRÁFICOS**  
**NOMIS Seismic Analysis**  
**Continuous Monitor Analysis**

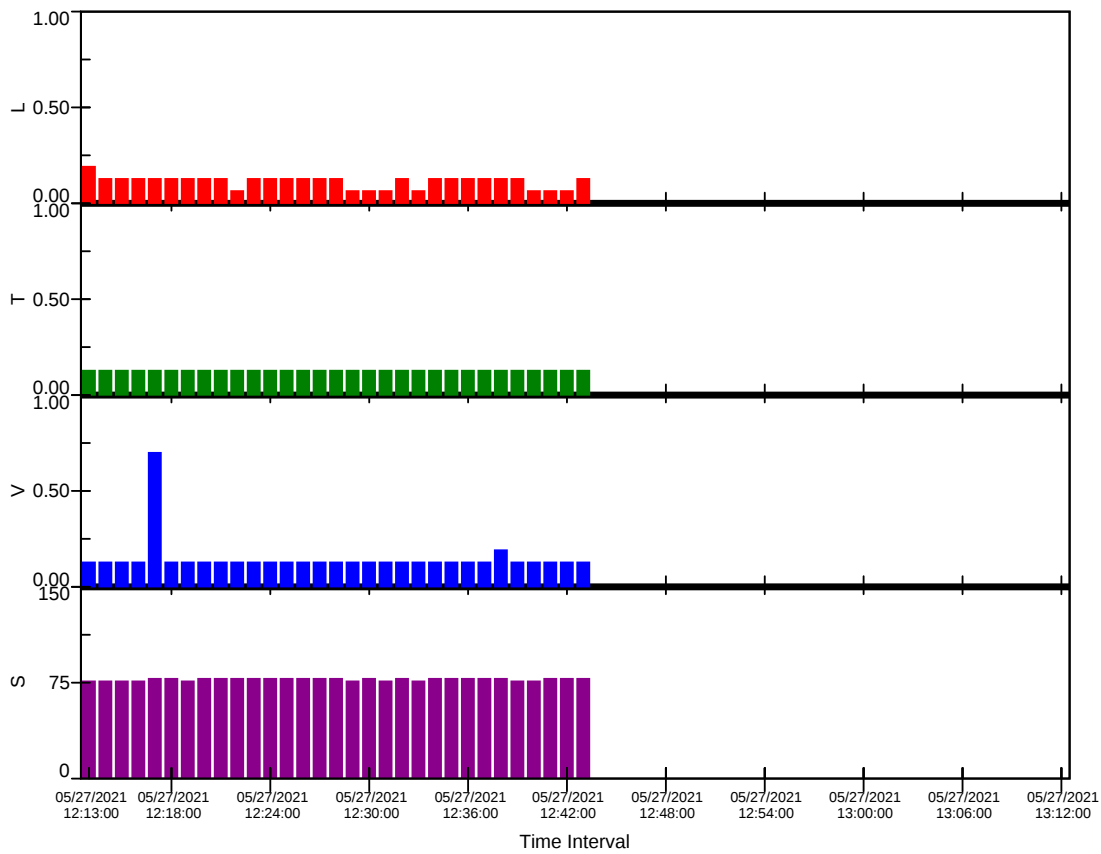
**Serial No:** 2215 v2.75  
**Date:** 05/27/2021 09:52:00  
**Event No:** 2  
**Record Time:** 30 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM17A – Rainforest Village  
**Distance:**  
**Operator:** L. Santamaría  
**Comment:**

**Continuous Monitor Recording  
Summary Data**

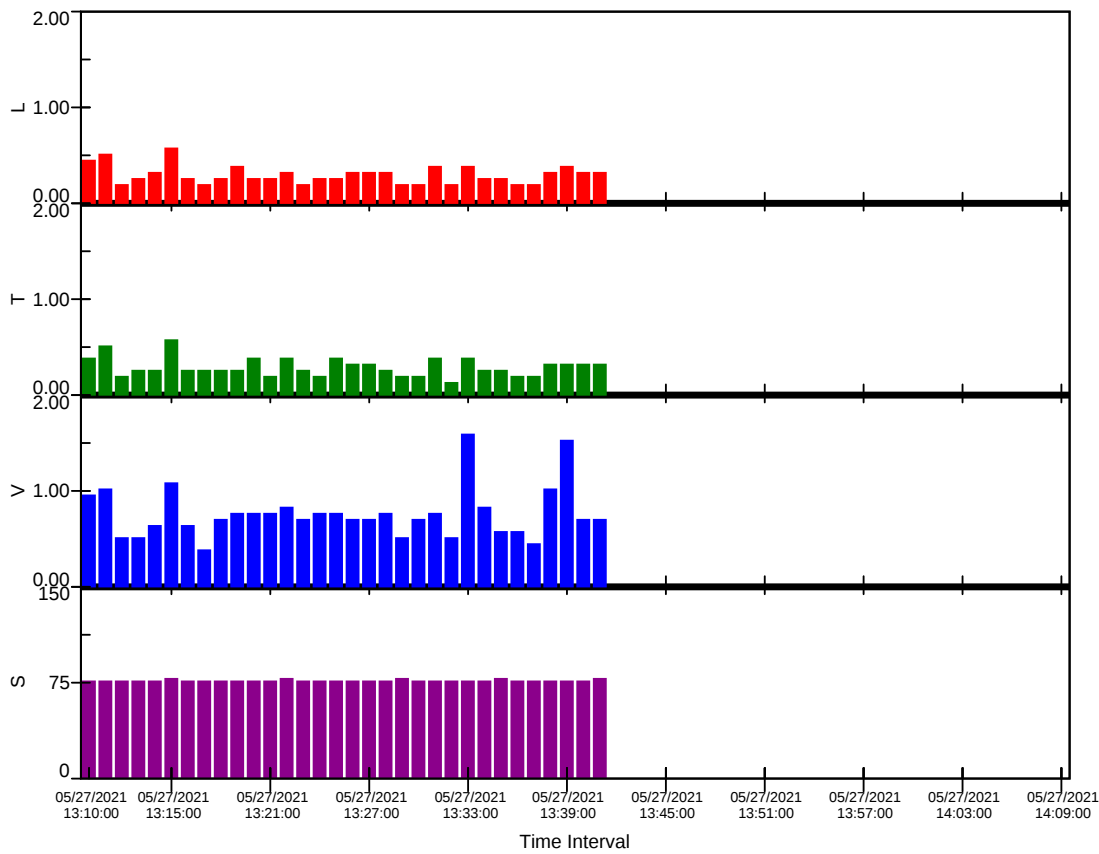
|                    | L    | T          | V     |
|--------------------|------|------------|-------|
| PPV (mm/s)         | 0.19 | 0.13       | 0.13  |
| FREQ (Hz)          | 0.4  | 250        | 166.7 |
| Peak Air Pressure: |      |            |       |
| Sample Size:       |      | 1440       |       |
| Interval Size:     |      | 60 seconds |       |



|                     |                        |                                                  |            |          |
|---------------------|------------------------|--------------------------------------------------|------------|----------|
| <b>Serial No:</b>   | 2215 v2.75             | <b>Continuous Monitor Recording Summary Data</b> |            |          |
| <b>Date:</b>        | 05/27/2021 12:13:00    | <b>L</b>                                         | <b>T</b>   | <b>V</b> |
| <b>Event No:</b>    | 3                      | 0.19                                             | 0.13       | 0.70     |
| <b>Record Time:</b> | 31 minutes             | <b>PPV (mm/s)</b>                                |            |          |
| <b>Client:</b>      | CSA Group              | <b>FREQ (Hz)</b>                                 | .5         | 166.7    |
| <b>Operation:</b>   | Corp. Quality Services |                                                  |            | 22.7     |
| <b>Location:</b>    | EM9 .- PPC             | <b>Peak Air Pressure:</b>                        |            |          |
| <b>Distance:</b>    |                        | <b>Sample Size:</b>                              | 1440       |          |
| <b>Operator:</b>    | L. Santamaría          | <b>Interval Size:</b>                            | 60 seconds |          |
| <b>Comment:</b>     |                        |                                                  |            |          |

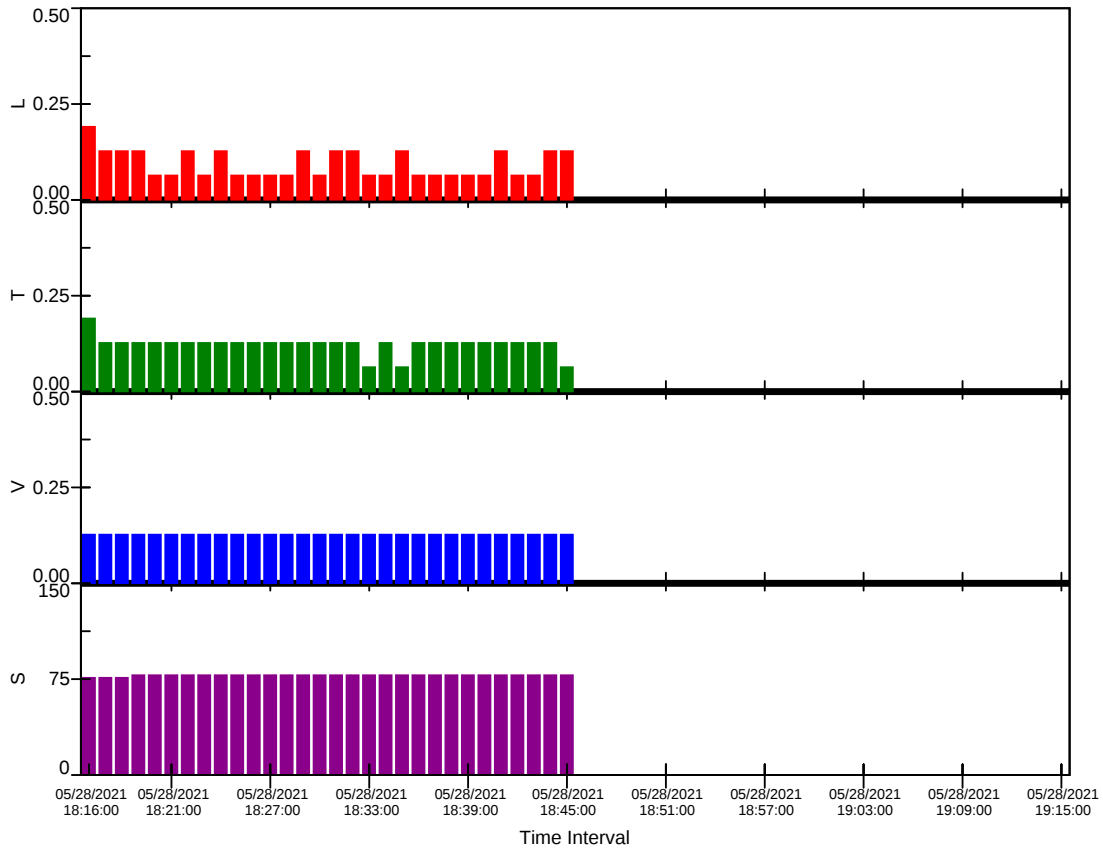


|                     |                        |                                                  |            |          |
|---------------------|------------------------|--------------------------------------------------|------------|----------|
| <b>Serial No:</b>   | 2215 v2.75             | <b>Continuous Monitor Recording Summary Data</b> |            |          |
| <b>Date:</b>        | 05/27/2021 13:10:00    |                                                  |            |          |
| <b>Event No:</b>    | 4                      | <b>L</b>                                         | <b>T</b>   | <b>V</b> |
| <b>Record Time:</b> | 32 minutes             | 0.57                                             | 0.57       | 1.08     |
| <b>Client:</b>      | CSA Group              | <b>FREQ (Hz)</b>                                 | 10.9       | 10.4     |
| <b>Operation:</b>   | Corp. Quality Services | <b>Peak Air Pressure:</b>                        |            |          |
| <b>Location:</b>    | EM12 – Railway Company | <b>Sample Size:</b>                              | 1440       |          |
| <b>Distance:</b>    |                        | <b>Interval Size:</b>                            | 60 seconds |          |
| <b>Operator:</b>    | L. Santamaría          |                                                  |            |          |
| <b>Comment:</b>     |                        |                                                  |            |          |



**Serial No:** 2215 v2.75  
**Date:** 05/28/2021 18:16:00  
**Event No:** 5  
**Record Time:** 30 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM9 - PPC  
**Distance:**  
**Operator:** L. Santamaría  
**Comment:**

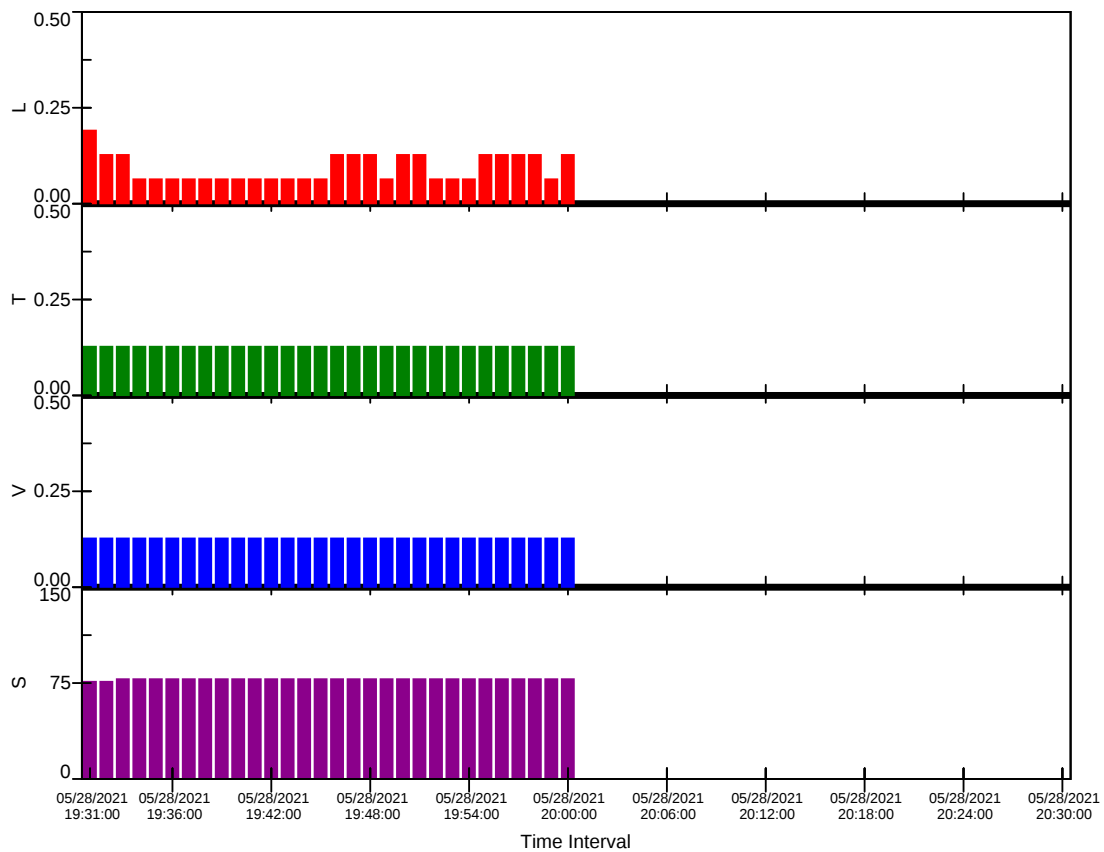
| Continuous Monitor Recording Summary Data |            |      |       |
|-------------------------------------------|------------|------|-------|
|                                           | L          | T    | V     |
| PPV (mm/s)                                | 0.19       | 0.19 | 0.13  |
| FREQ (Hz)                                 | .4         | .8   | 166.7 |
| Peak Air Pressure:                        |            |      |       |
| Sample Size:                              | 1440       |      |       |
| Interval Size:                            | 60 seconds |      |       |



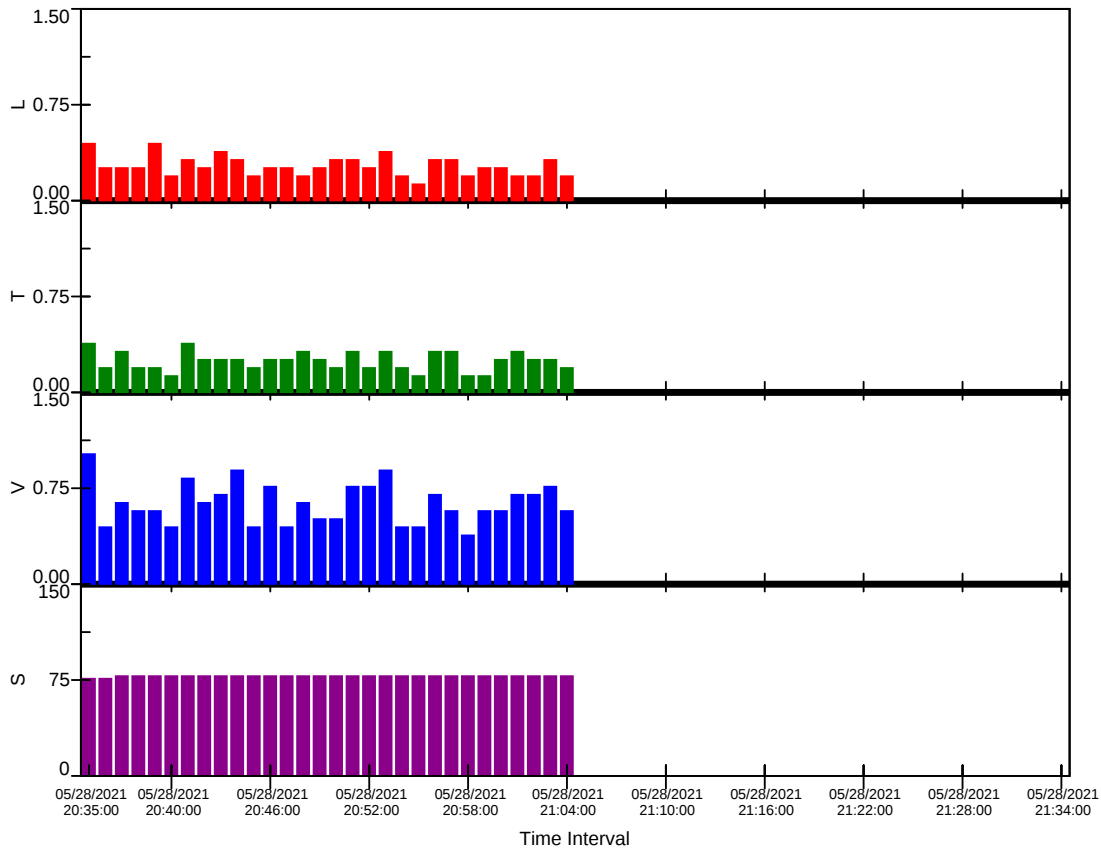
**Serial No:** 2215 v2.75  
**Date:** 05/28/2021 19:31:00  
**Event No:** 6  
**Record Time:** 30 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM12 – Railway Company  
**Distance:**  
**Operator:** L. Santamaría  
**Comment:**

**Continuous Monitor Recording  
Summary Data**

|                           | <b>L</b> | <b>T</b>   | <b>V</b> |
|---------------------------|----------|------------|----------|
| <b>PPV (mm/s)</b>         | 0.19     | 0.13       | 0.13     |
| <b>FREQ (Hz)</b>          | 6.2      | 250.0      | 166.7    |
| <b>Peak Air Pressure:</b> |          |            |          |
| <b>Sample Size:</b>       |          | 1440       |          |
| <b>Interval Size:</b>     |          | 60 seconds |          |



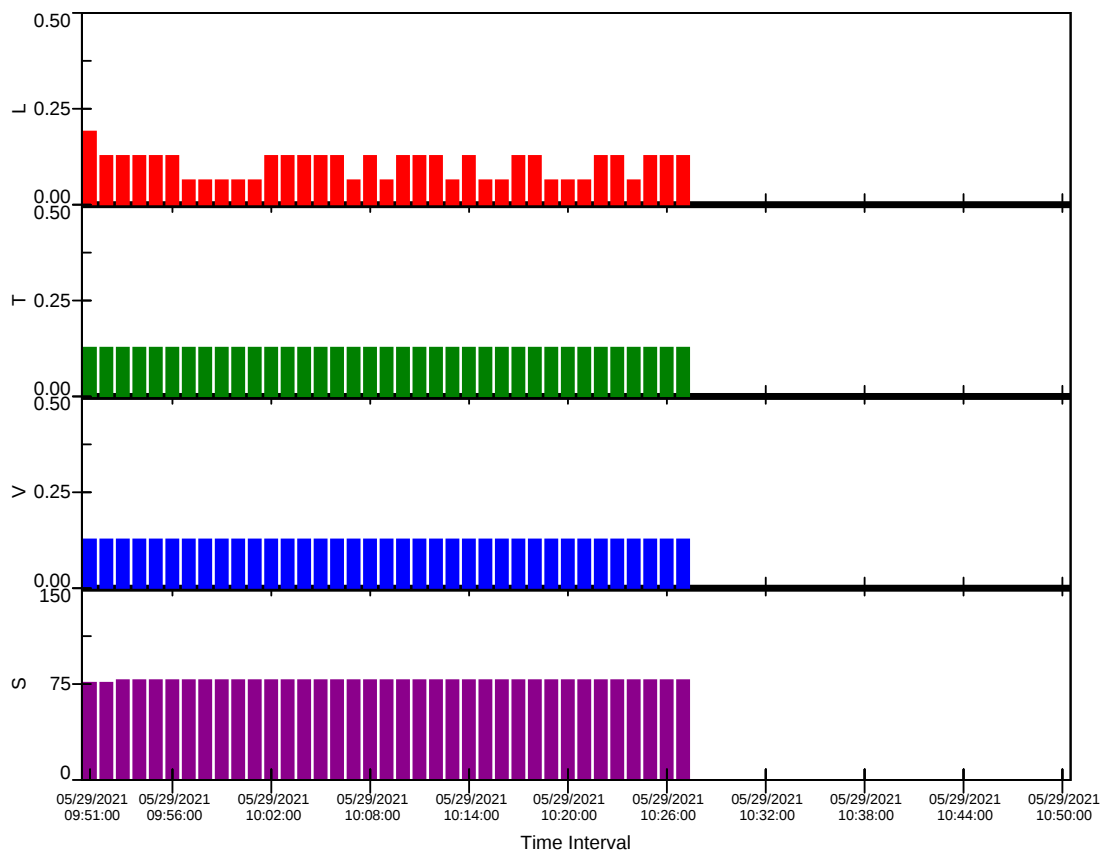
|                     |                            |                                     |            |          |
|---------------------|----------------------------|-------------------------------------|------------|----------|
| <b>Serial No:</b>   | 2215 v2.75                 | <b>Continuous Monitor Recording</b> |            |          |
| <b>Date:</b>        | 05/28/2021 20:35:00        | <b>Summary Data</b>                 |            |          |
| <b>Event No:</b>    | 7                          | <b>L</b>                            | <b>T</b>   | <b>V</b> |
| <b>Record Time:</b> | 30 minutes                 | 0.44                                | 0.38       | 1.02     |
| <b>Client:</b>      | CSA Group                  | <b>FREQ (Hz)</b>                    | 9.1        | 10.4     |
| <b>Operation:</b>   | Corp. Quality Services     | <b>Peak Air Pressure:</b>           |            |          |
| <b>Location:</b>    | EM17A – Rainforest Village | <b>Sample Size:</b>                 | 1440       |          |
| <b>Distance:</b>    |                            | <b>Interval Size:</b>               | 60 seconds |          |
| <b>Operator:</b>    | L. Santamaría              |                                     |            |          |
| <b>Comment:</b>     |                            |                                     |            |          |



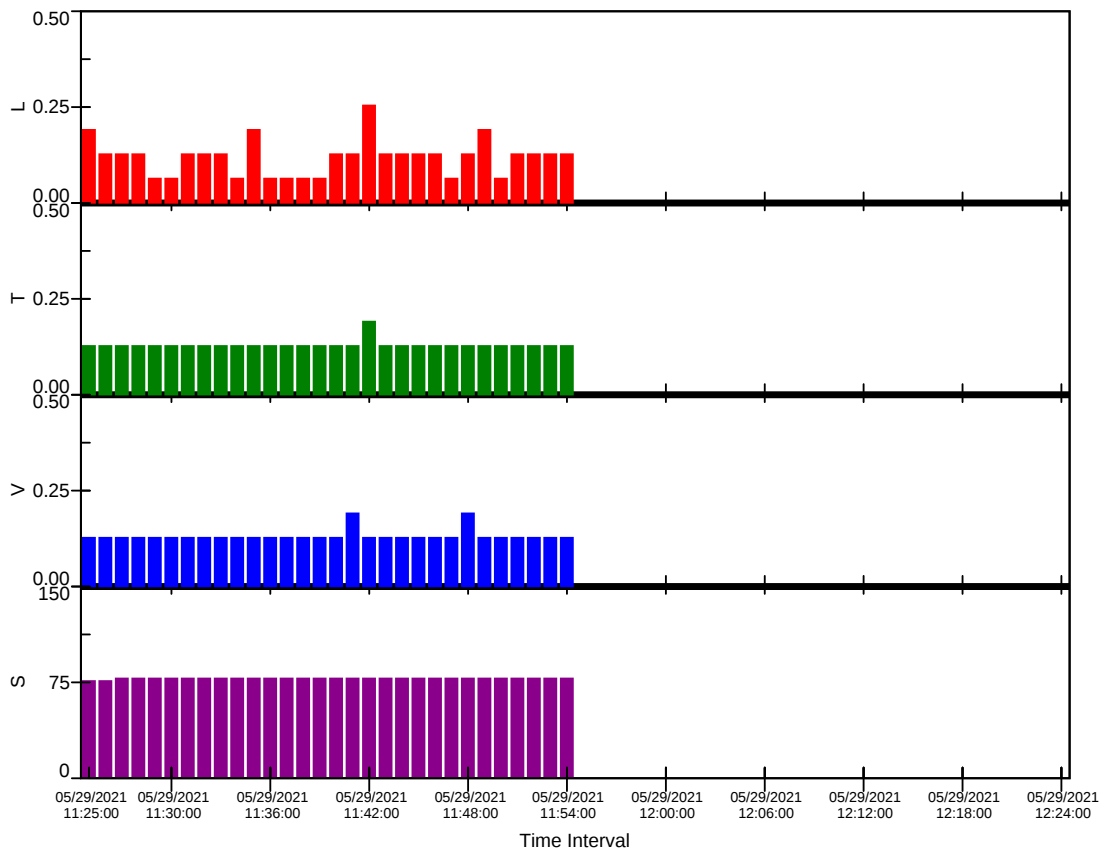
**Serial No:** 2215 v2.75  
**Date:** 05/29/2021 09:51:00  
**Event No:** 8  
**Record Time:** 37 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM17A – Rainforest Village  
**Distance:**  
**Operator:** L. Santamaría  
**Comment:**

**Continuous Monitor Recording  
Summary Data**  

|                           | L    | T          | V     |
|---------------------------|------|------------|-------|
| <b>PPV (mm/s)</b>         | 0.19 | 0.13       | 0.13  |
| <b>FREQ (Hz)</b>          | .4   | 250.0      | 250.0 |
| <b>Peak Air Pressure:</b> |      |            |       |
| <b>Sample Size:</b>       |      | 1440       |       |
| <b>Interval Size:</b>     |      | 60 seconds |       |



|                     |                        |                                     |            |          |
|---------------------|------------------------|-------------------------------------|------------|----------|
| <b>Serial No:</b>   | 2215 v2.75             | <b>Continuous Monitor Recording</b> |            |          |
| <b>Date:</b>        | 05/29/2021 11:25:00    | <b>Summary Data</b>                 |            |          |
| <b>Event No:</b>    | 9                      | <b>L</b>                            | <b>T</b>   | <b>V</b> |
| <b>Record Time:</b> | 30 minutes             | 0.25                                | 0.19       | 0.19     |
| <b>Client:</b>      | CSA Group              | <b>FREQ (Hz)</b>                    | 83.3       | 83.3     |
| <b>Operation:</b>   | Corp. Quality Services | <b>Peak Air Pressure:</b>           |            |          |
| <b>Location:</b>    | EM9 - PPC              | <b>Sample Size:</b>                 | 1440       |          |
| <b>Distance:</b>    |                        | <b>Interval Size:</b>               | 60 seconds |          |
| <b>Operator:</b>    | L. Santamaría          |                                     |            |          |
| <b>Comment:</b>     |                        |                                     |            |          |

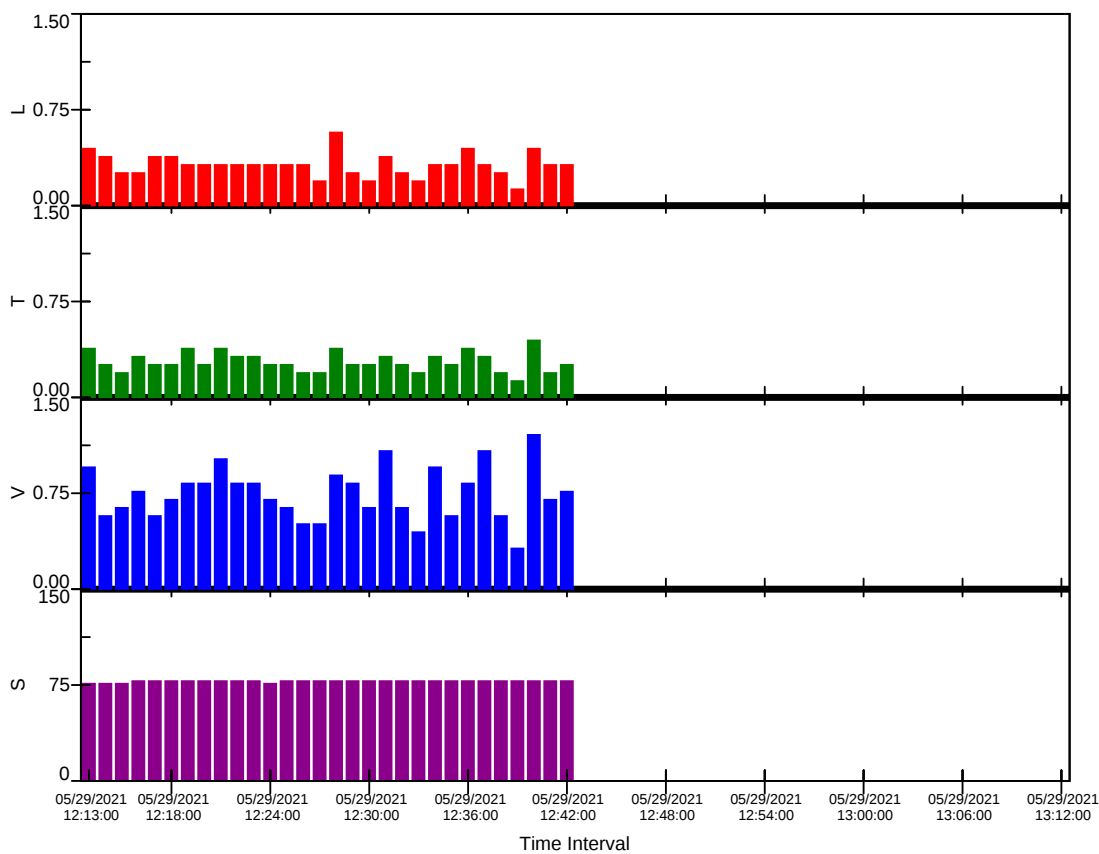


**Serial No:** 2215 v2.75  
**Date:** 05/29/2021 12:13:00  
**Event No:** 10  
**Record Time:** 30 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM12 – Railway Company  
**Distance:**  
**Operator:** L. Santamaría  
**Comment:**

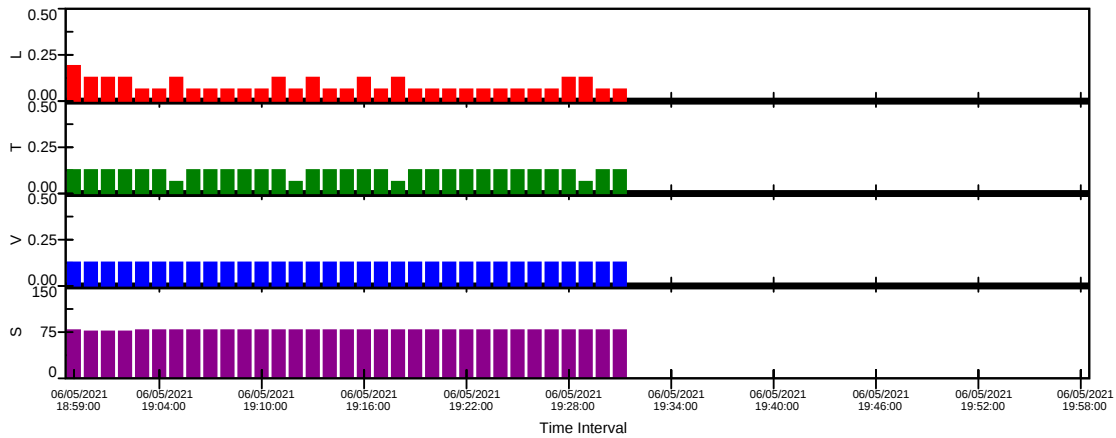
**Continuous Monitor Recording Summary Data**  

|                   | L    | T    | V    |
|-------------------|------|------|------|
| <b>PPV (mm/s)</b> | 0.57 | 0.38 | 1.02 |
| <b>FREQ (Hz)</b>  | 9.6  | 11.1 | 7.2  |

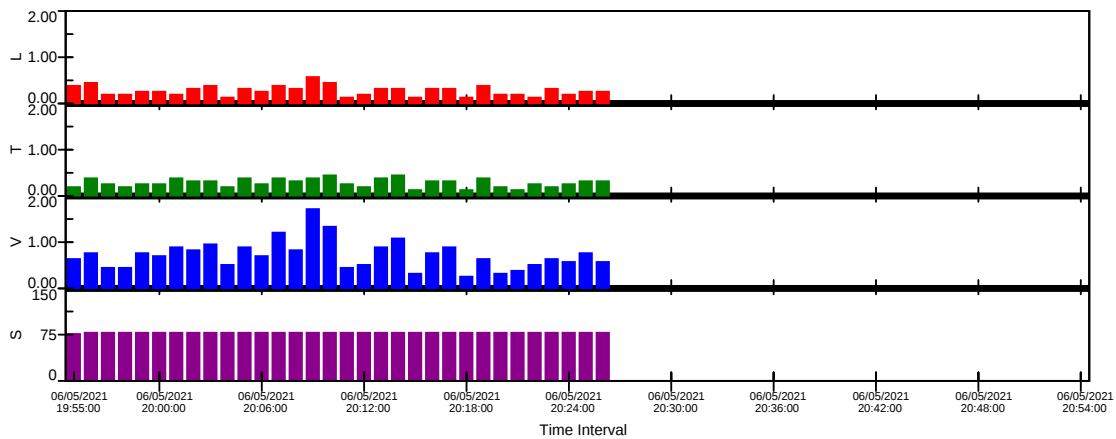
  
**Peak Air Pressure:**  
**Sample Size:** 1440  
**Interval Size:** 60 seconds



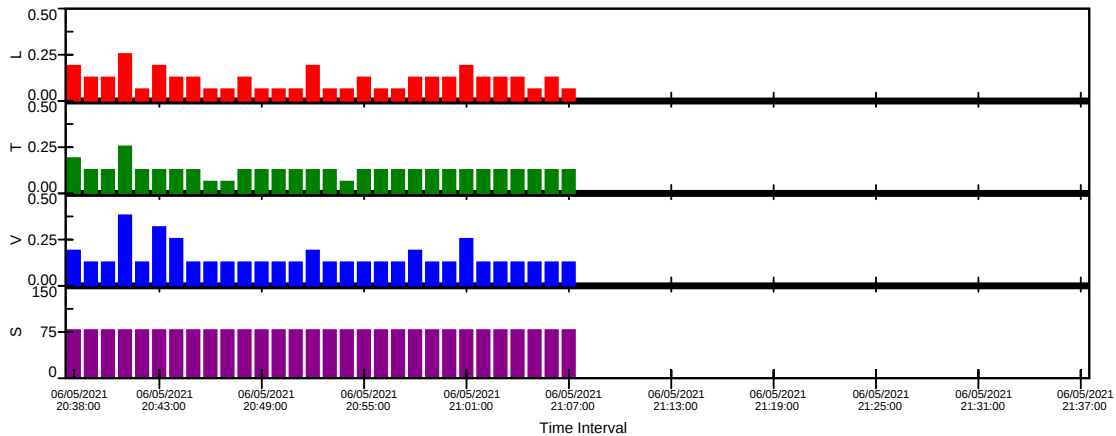
|                              |                            |                                |                     |                    |
|------------------------------|----------------------------|--------------------------------|---------------------|--------------------|
| <b>Serial Number:</b>        | 2215 v2.75                 | <b>Long (mm/s)</b>             | <b>Trans (mm/s)</b> | <b>Vert (mm/s)</b> |
| <b>Histogram Start Time:</b> | junio 05, 2021 18:59:00    | <b>PPV</b> 0.19                | 0.13                | 0.13               |
| <b>Histogram Stop Time:</b>  | junio 05, 2021 19:32:00    | <b>ZC Freq</b> 0.4             | 166.7               | 62.5               |
| <b>Number of Intervals:</b>  | 33 at 60 seconds           | <b>Date</b>                    | jun 05, '21         | jun 05, '21        |
|                              | 18:59:00                   | <b>Time</b>                    | 18:59:00            | 18:59:00           |
| <b>Range:</b>                | Not Applicable             | <b>Peak Vector Sum</b>         |                     |                    |
| <b>Sample Rate:</b>          | 1000 Samples/Second        | <b>Average Vibration Level</b> |                     |                    |
| <b>Notes</b>                 |                            | <b>Long (mm/s)</b>             |                     |                    |
| <b>(mm/s) Vert (mm/s)</b>    |                            | <b>Tran</b>                    |                     |                    |
| Client:                      | CSA Group                  | 0.09                           |                     |                    |
| Location:                    | EM17A – Rainforest Village |                                |                     |                    |
| User:                        | L. Santamaría              |                                |                     |                    |
| Seis Location:               |                            | <b>Microphone</b>              | Not Applicable      |                    |
| Comment:                     |                            | <b>PSPL</b>                    |                     |                    |
|                              |                            | <b>ZC Freq</b>                 | Not Applicable      |                    |

**Additional Notes**

|                              |                         |                    |                                |                    |
|------------------------------|-------------------------|--------------------|--------------------------------|--------------------|
| <b>Serial Number:</b>        | 2215 v2.75              | <b>Long (mm/s)</b> | <b>Trans (mm/s)</b>            | <b>Vert (mm/s)</b> |
| <b>Histogram Start Time:</b> | junio 05, 2021 19:55:00 | <b>PPV</b> 0.57    | 0.44                           | 1.71               |
| <b>Histogram Stop Time:</b>  | junio 05, 2021 20:27:00 | <b>ZC Freq</b> 3.9 | 6.8                            | 2.9                |
| <b>Number of Intervals:</b>  | 32 at 60 seconds        |                    | <b>Date</b> jun 05, '21        | jun 05, '21        |
|                              | 20:09:00                |                    | <b>Time</b> 20:09:00           | 20:10:00           |
| <b>Range:</b>                | Not Applicable          |                    |                                |                    |
| <b>Sample Rate:</b>          | 1000 Samples/Second     |                    |                                |                    |
| <b>Notes</b>                 |                         |                    | <b>Peak Vector Sum</b>         |                    |
| <b>(mm/s) Vert (mm/s)</b>    |                         |                    | <b>Average Vibration Level</b> |                    |
| <b>Client:</b>               | CSA Group               |                    | <b>Long (mm/s)</b>             | <b>Tran</b>        |
| 0.72                         |                         |                    | 0.27                           | 0.28               |
| <b>Location:</b>             | EM12 – Railway Company  |                    |                                |                    |
| <b>User:</b>                 | L. Santamaria           |                    | <b>Microphone</b>              | Not Applicable     |
| <b>Seis Location:</b>        |                         |                    | <b>PSPL</b>                    |                    |
| <b>Comment:</b>              |                         |                    | <b>ZC Freq</b>                 | Not Applicable     |

**Additional Notes**

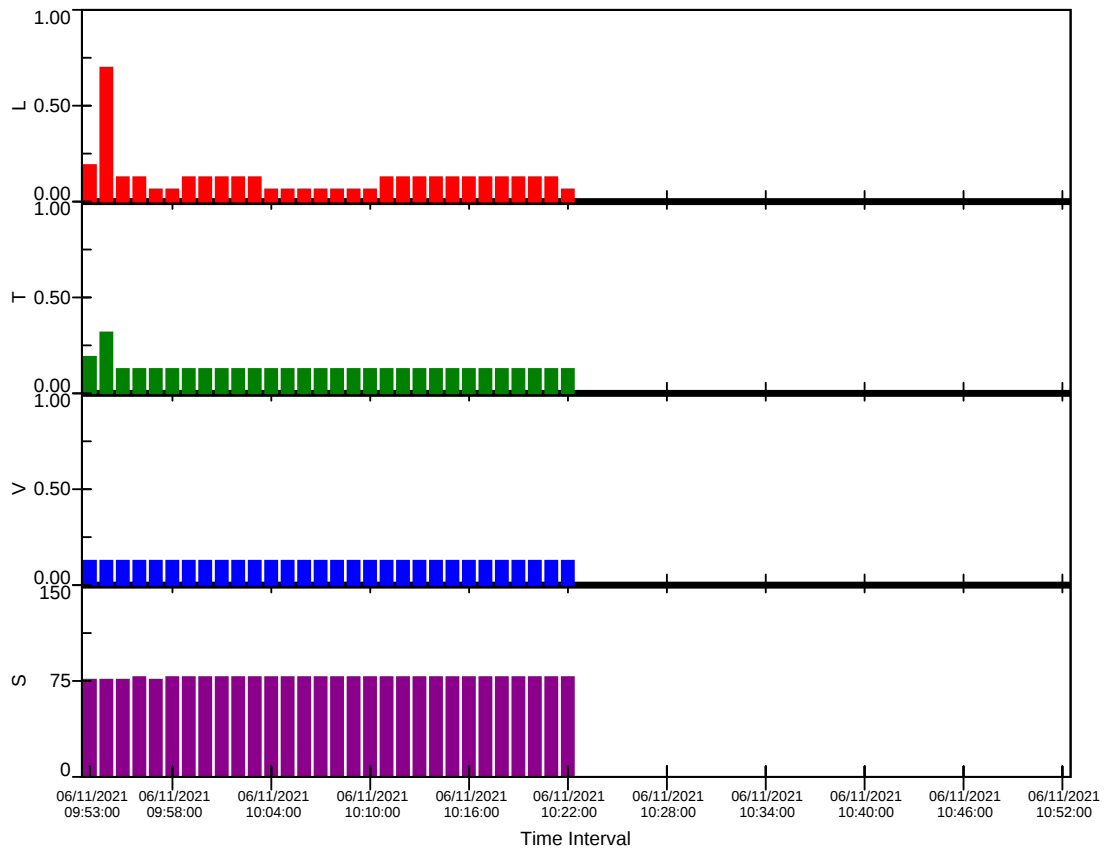
|                              |                         |                                |                     |                    |
|------------------------------|-------------------------|--------------------------------|---------------------|--------------------|
| <b>Serial Number:</b>        | 2215 v2.75              | <b>Long (mm/s)</b>             | <b>Trans (mm/s)</b> | <b>Vert (mm/s)</b> |
| <b>Histogram Start Time:</b> | junio 05, 2021 20:38:00 | <b>PPV</b> 0.25                | 0.25                | 0.38               |
| <b>Histogram Stop Time:</b>  | junio 05, 2021 21:08:00 | <b>ZC Freq</b> 50.0            | 62.5                | 35.7               |
| <b>Number of Intervals:</b>  | 30 at 60 seconds        | <b>Date</b>                    | jun 05, '21         | jun 05, '21        |
| <b>Range:</b>                | Not Applicable          | <b>Time</b>                    | 20:41:00            | 20:41:00           |
| <b>Sample Rate:</b>          | 1000 Samples/Second     | <b>Peak Vector Sum</b>         |                     |                    |
| <b>Notes</b>                 |                         | <b>Average Vibration Level</b> |                     |                    |
| <b>(mm/s) Vert (mm/s)</b>    |                         | <b>Long (mm/s)</b>             |                     | <b>Tran</b>        |
| Client:                      | CSA Group               | 0.11                           |                     | 0.13               |
| Location:                    | EM9 - PPC               |                                |                     |                    |
| User:                        | L. Santamaría           | <b>Microphone</b>              | Not Applicable      |                    |
| Seis Location:               |                         | <b>PSPL</b>                    |                     |                    |
| Comment:                     |                         | <b>ZC Freq</b>                 | Not Applicable      |                    |

**Additional Notes**

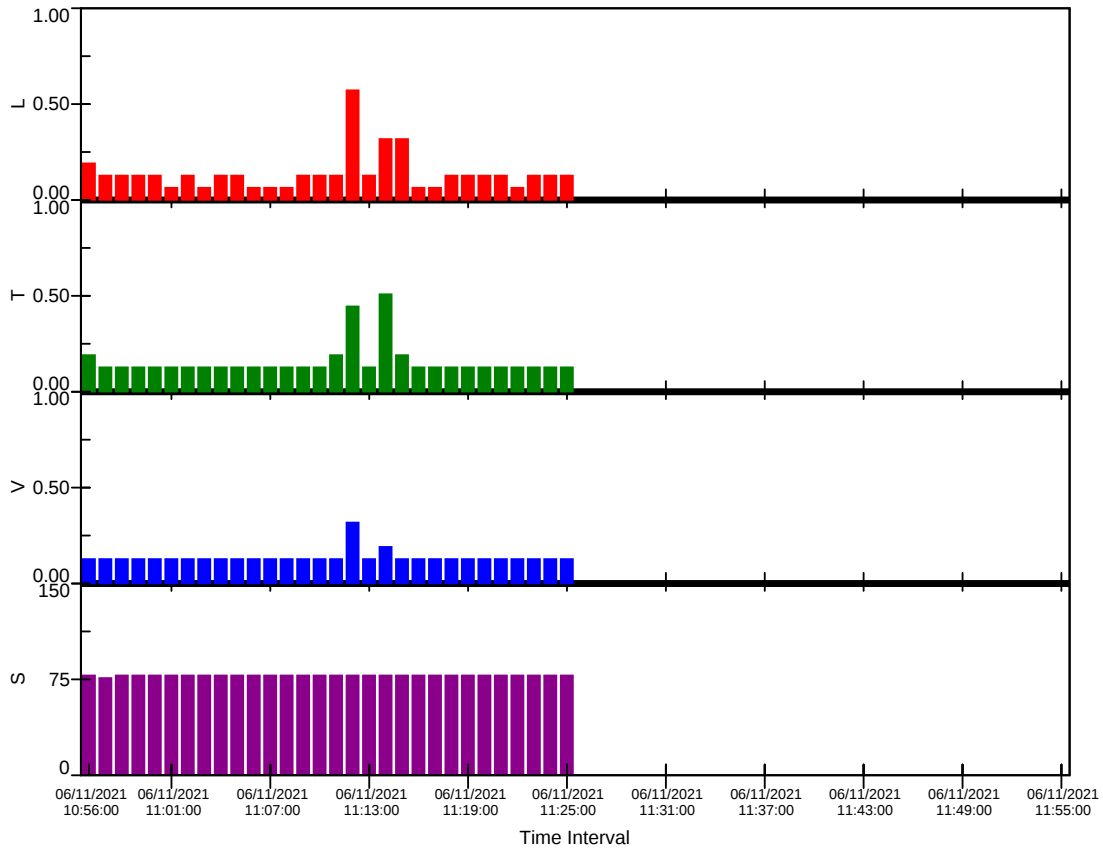
**Serial No:** 2215 v2.75  
**Date:** 06/11/2021 09:53:00  
**Event No:** 1  
**Record Time:** 30 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM1 B – Campamento 5K+800  
**Distance:**  
**Operator:** L. Santamaría  
**Comment:**

**Continuous Monitor Recording  
Summary Data**

|                    | L     | T          | V     |
|--------------------|-------|------------|-------|
| PPV (mm/s)         | 0.70  | 0.32       | 0.13  |
| FREQ (Hz)          | 125.0 | 125.0      | 250.0 |
| Peak Air Pressure: |       |            |       |
| Sample Size:       |       | 1440       |       |
| Interval Size:     |       | 60 seconds |       |



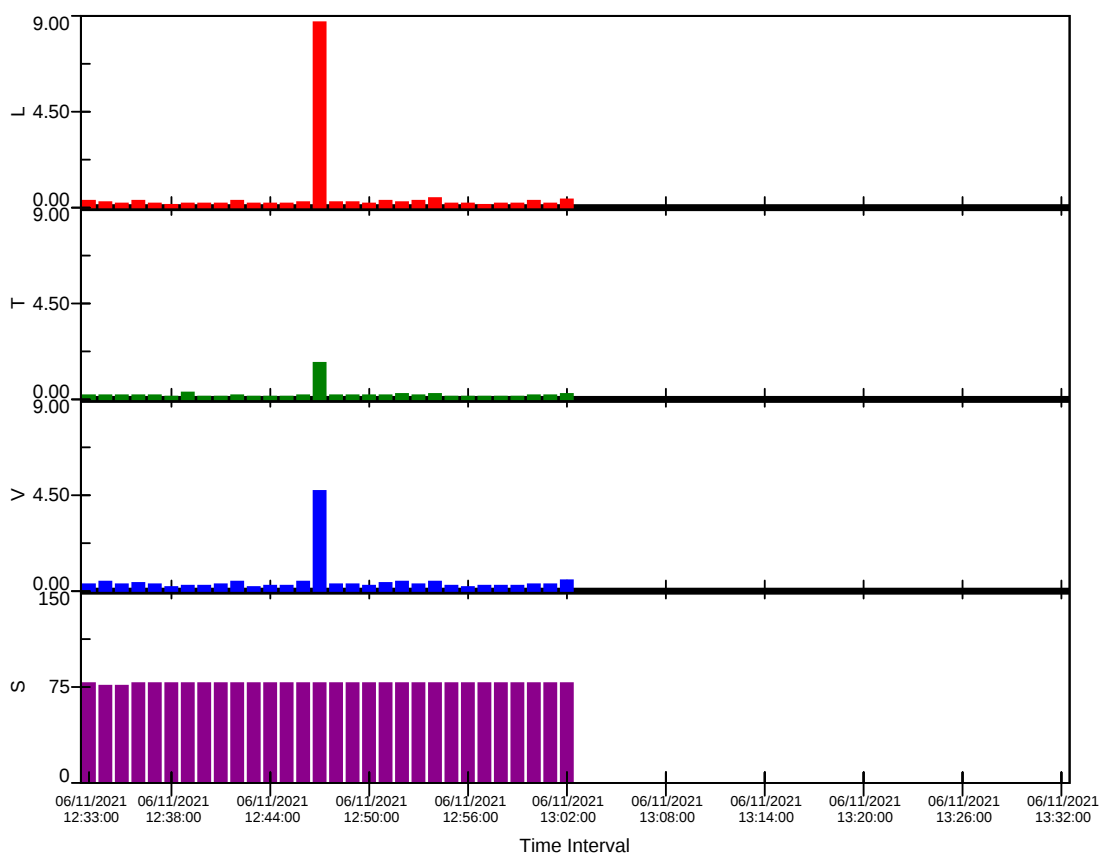
|                     |                               |                                     |            |          |
|---------------------|-------------------------------|-------------------------------------|------------|----------|
| <b>Serial No:</b>   | 2215 v2.75                    | <b>Continuous Monitor Recording</b> |            |          |
| <b>Date:</b>        | 06/11/2021 10:56:00           | <b>Summary Data</b>                 |            |          |
| <b>Event No:</b>    | 2                             | <b>L</b>                            | <b>T</b>   | <b>V</b> |
| <b>Record Time:</b> | 30 minutes                    | 0.57                                | 0.44       | 0.32     |
| <b>Client:</b>      | CSA Group                     | <b>FREQ (Hz)</b>                    | 100.0      | 100.0    |
| <b>Operation:</b>   | Corp. Quality Services        | <b>Peak Air Pressure:</b>           |            |          |
| <b>Location:</b>    | EM6 – Campamento Oeste 5K+200 | <b>Sample Size:</b>                 | 1440       |          |
| <b>Distance:</b>    |                               | <b>Interval Size:</b>               | 60 seconds |          |
| <b>Operator:</b>    | L. Santamaría                 |                                     |            |          |
| <b>Comment:</b>     |                               |                                     |            |          |



**Serial No:** 2215 v2.75  
**Date:** 06/11/2021 12:33:00  
**Event No:** 3  
**Record Time:** 30 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM13 – Policía Nacional  
**Distance:**  
**Operator:** L. Santamaría  
**Comment:**

**Continuous Monitor Recording  
Summary Data**

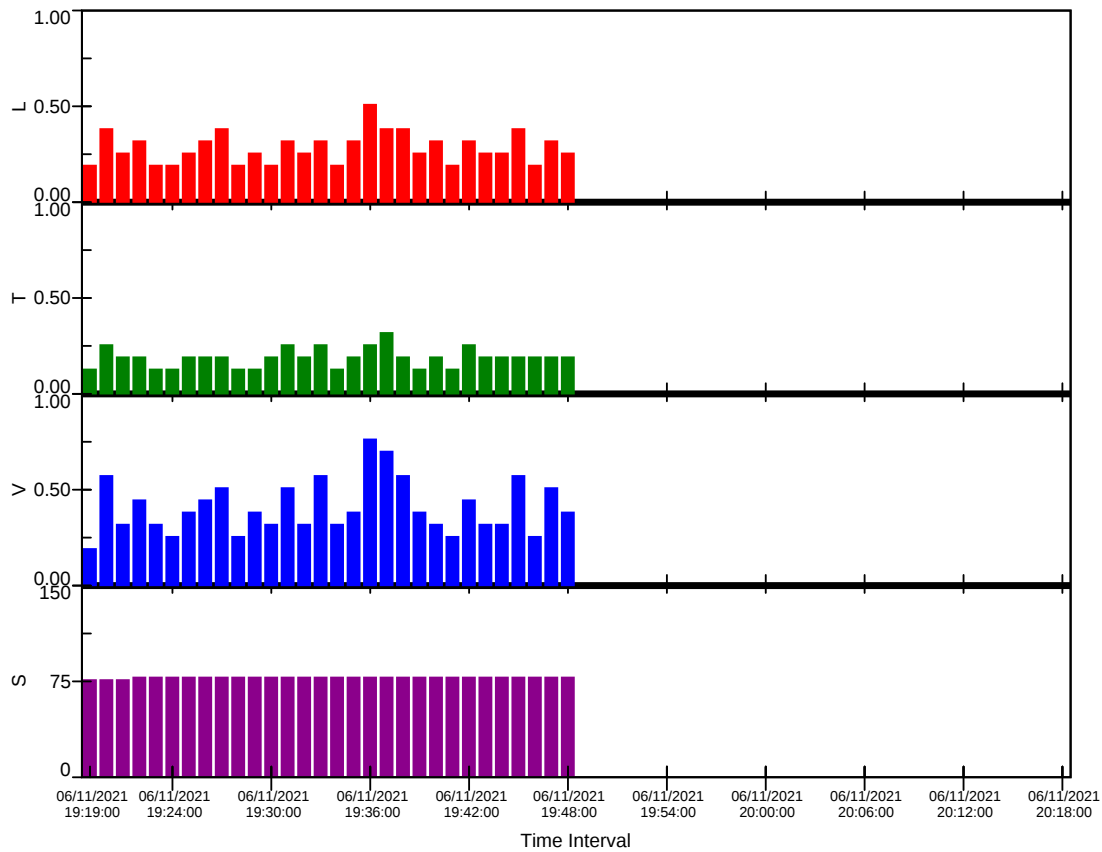
|                           | L     | T          | V    |
|---------------------------|-------|------------|------|
| <b>PPV (mm/s)</b>         | 8.70  | 1.71       | 4.70 |
| <b>FREQ (Hz)</b>          | 125.0 | 166.7      | 16.7 |
| <b>Peak Air Pressure:</b> |       |            |      |
| <b>Sample Size:</b>       |       | 1440       |      |
| <b>Interval Size:</b>     |       | 60 seconds |      |



**Serial No:** 2215 v2.75  
**Date:** 06/11/2021 19:19:00  
**Event No:** 4  
**Record Time:** 30 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM1 B – Campamento 5K+800  
**Distance:**  
**Operator:** L. Santamaría  
**Comment:**

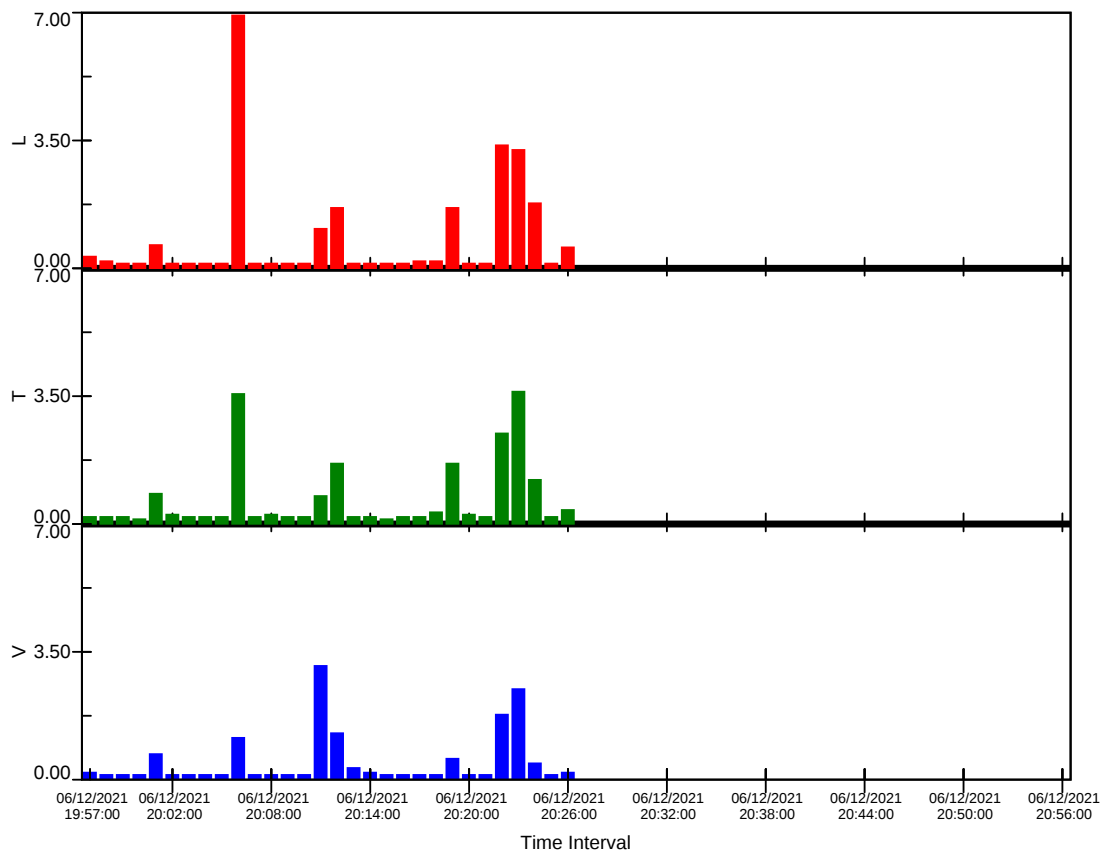
**Continuous Monitor Recording  
Summary Data**

|                    | L    | T          | V    |
|--------------------|------|------------|------|
| PPV (mm/s)         | 0.38 | 0.25       | 0.57 |
| FREQ (Hz)          | 11.1 | 10.6       | 10.2 |
| Peak Air Pressure: |      |            |      |
| Sample Size:       |      | 1440       |      |
| Interval Size:     |      | 60 seconds |      |

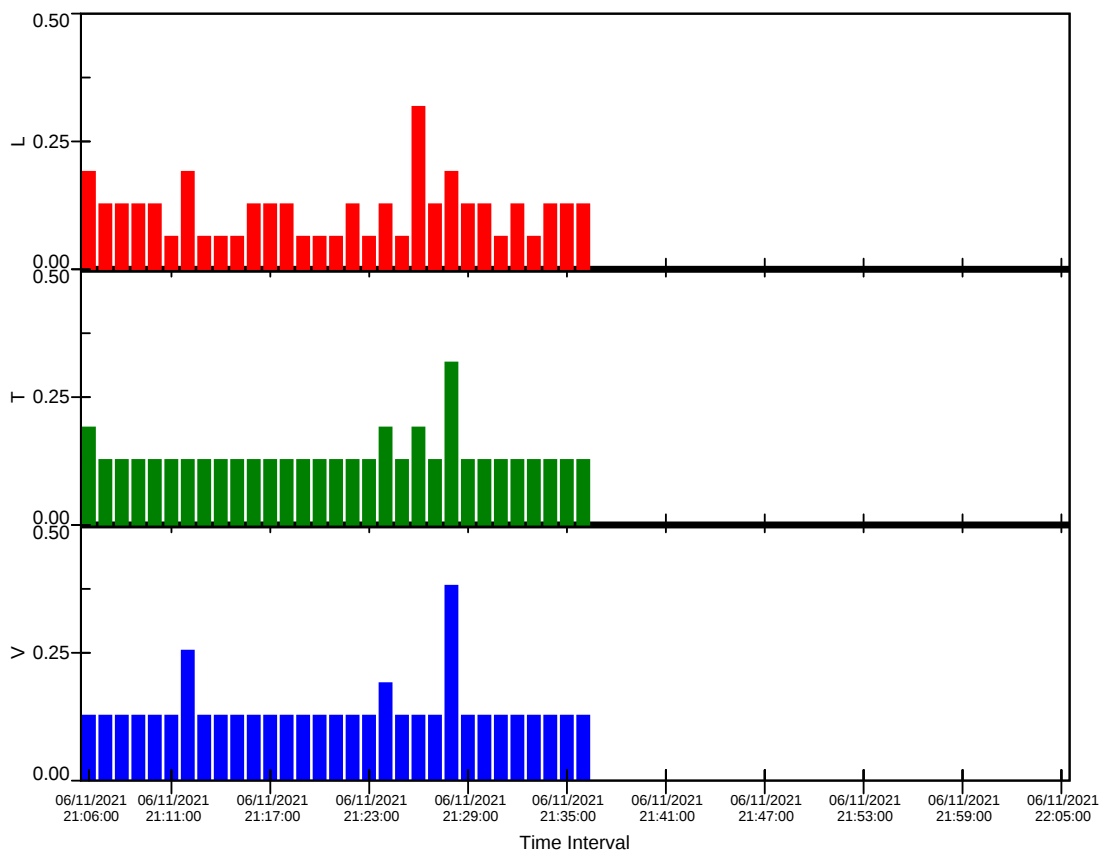


**Serial No:** 2215 v2.75  
**Date:** 06/11/2021 19:57:00  
**Event No:** 4  
**Record Time:** 30 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM6 – Campamento Oeste 5K+200  
**Distance:**  
**Operator:** L. Santamaría  
**Comment:**

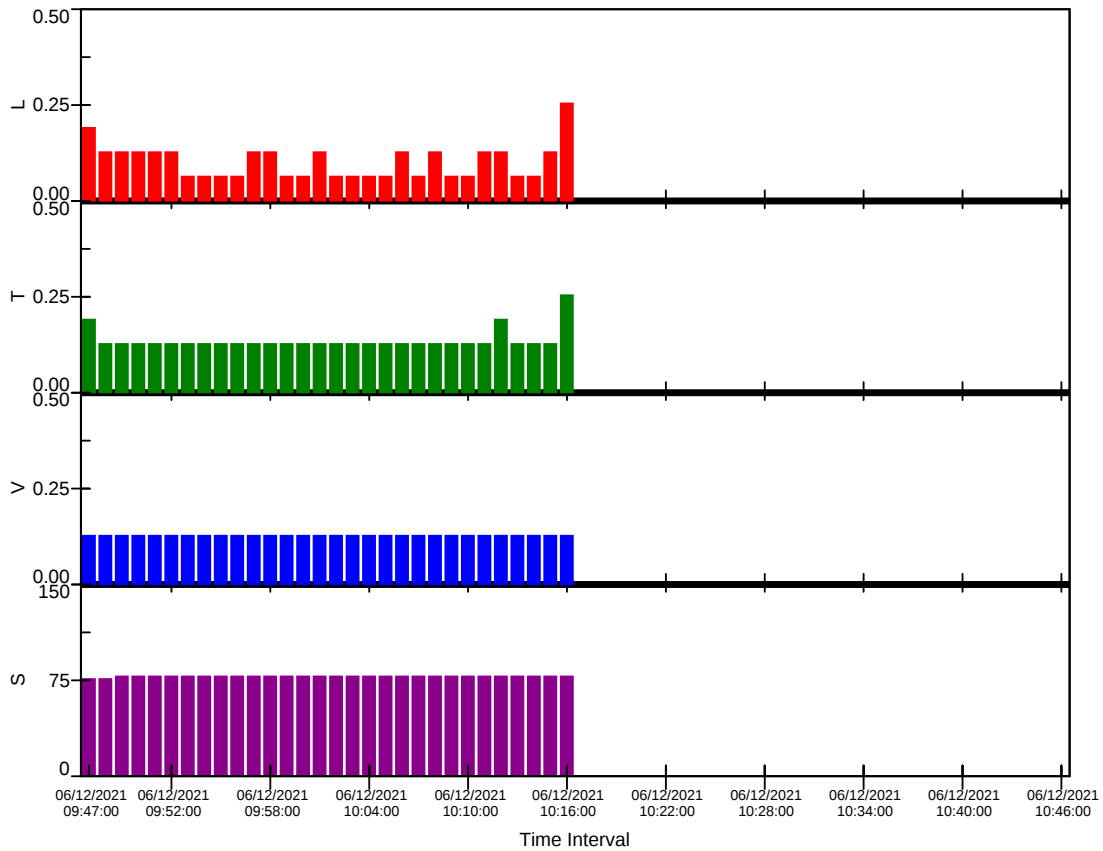
| Continuous Monitor Recording Summary Data |            |       |       |
|-------------------------------------------|------------|-------|-------|
|                                           | L          | T     | V     |
| PPV (mm/s)                                | 0.254      | 0.318 | 0.445 |
| FREQ (Hz)                                 | 6.8        | 29.4  | 55.6  |
| Peak Air Pressure:                        | NA         |       |       |
| Sample Size:                              | 1440       |       |       |
| Interval Size:                            | 60 seconds |       |       |



|                     |                         |                                                  |            |          |
|---------------------|-------------------------|--------------------------------------------------|------------|----------|
| <b>Serial No:</b>   | 2215 v2.75              | <b>Continuous Monitor Recording Summary Data</b> |            |          |
| <b>Date:</b>        | 06/11/2021 21:06:00     | <b>L</b>                                         | <b>T</b>   | <b>V</b> |
| <b>Event No:</b>    | 2                       | 0.191                                            | 0.191      | 0.254    |
| <b>Record Time:</b> | 31 minutes              | <b>PPV (mm/s)</b>                                | 125        | 38.5     |
| <b>Client:</b>      | CSA Group               | <b>FREQ (Hz)</b>                                 |            |          |
| <b>Operation:</b>   | Corp. Quality Services  | <b>Peak Air Pressure:</b>                        | NA         |          |
| <b>Location:</b>    | EM13 – Policía Nacional | <b>Sample Size:</b>                              | 1440       |          |
| <b>Distance:</b>    |                         | <b>Interval Size:</b>                            | 60 seconds |          |
| <b>Operator:</b>    | L. Santamaría           |                                                  |            |          |
| <b>Comment:</b>     |                         |                                                  |            |          |



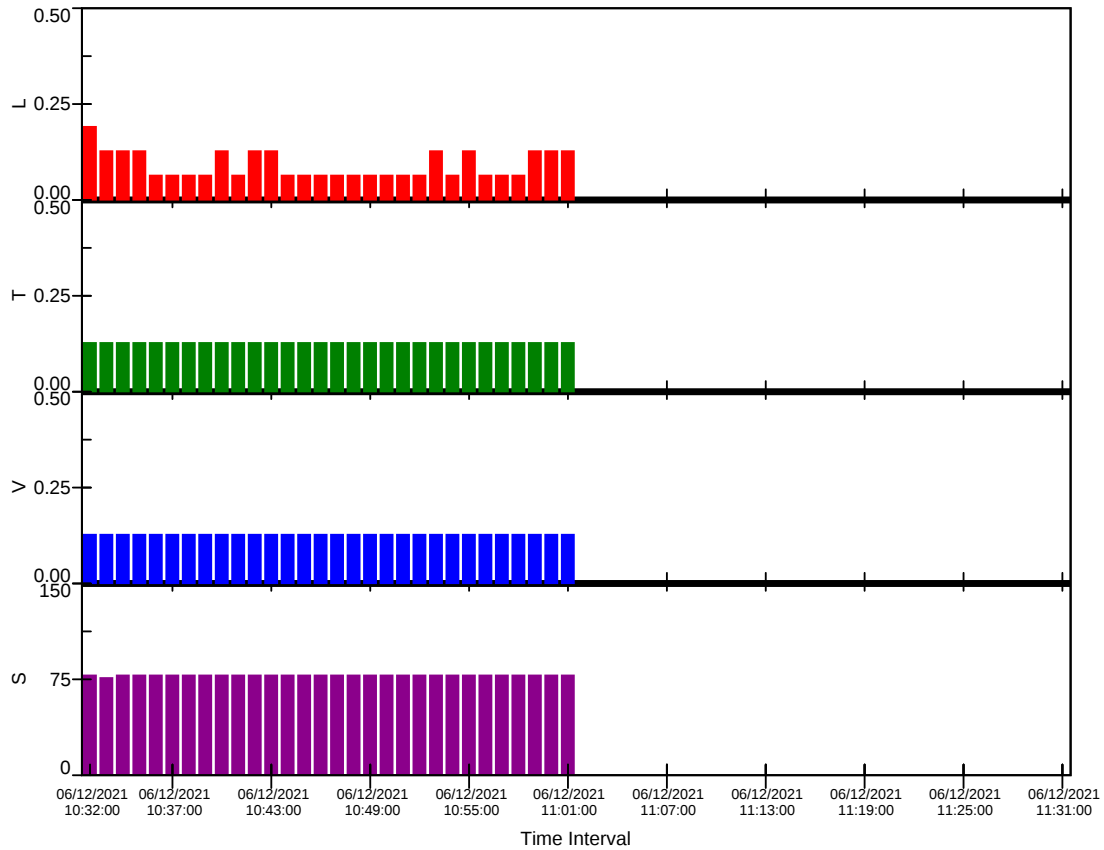
|                     |                                 |                                                  |            |          |
|---------------------|---------------------------------|--------------------------------------------------|------------|----------|
| <b>Serial No:</b>   | 2215 v2.75                      | <b>Continuous Monitor Recording Summary Data</b> |            |          |
| <b>Date:</b>        | 06/12/2021 09:47:00             | <b>L</b>                                         | <b>T</b>   | <b>V</b> |
| <b>Event No:</b>    | 5                               | 0.19                                             | 0.19       | 0.13     |
| <b>Record Time:</b> | 30 minutes                      | <b>PPV (mm/s)</b>                                |            |          |
| <b>Client:</b>      | CSA Group                       | <b>FREQ (Hz)</b>                                 | 0.4        | 0.9      |
| <b>Operation:</b>   | Corp. Quality Services          |                                                  |            | 166.7    |
| <b>Location:</b>    | EM1 B - Campamento Oeste 5K+800 | <b>Peak Air Pressure:</b>                        |            |          |
| <b>Distance:</b>    |                                 | <b>Sample Size:</b>                              | 1440       |          |
| <b>Operator:</b>    | L. Santamaría                   | <b>Interval Size:</b>                            | 60 seconds |          |
| <b>Comment:</b>     |                                 |                                                  |            |          |



**Serial No:** 2215 v2.75  
**Date:** 06/12/2021 10:32:00  
**Event No:** 6  
**Record Time:** 30 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM6 – Campamento Oeste 5K+200  
**Distance:**  
**Operator:** L. Santamaría  
**Comment:**

**Continuous Monitor Recording  
Summary Data**

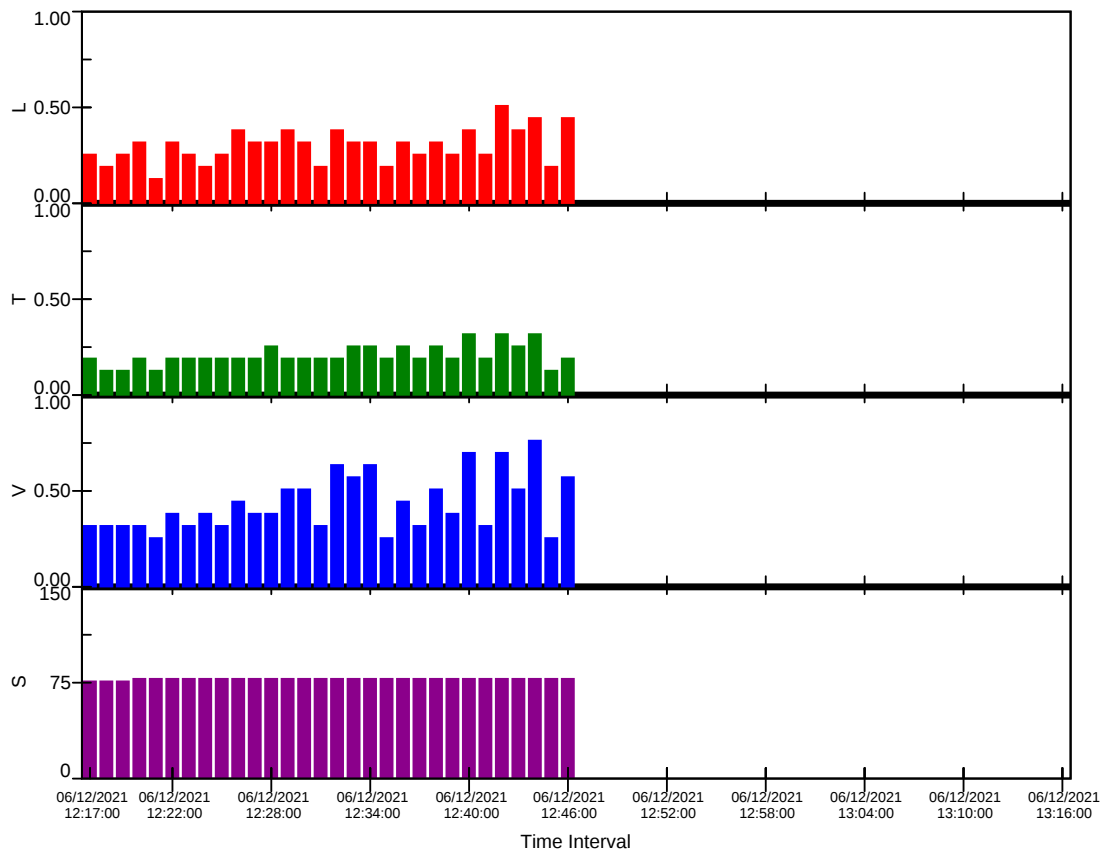
|                    | L    | T          | V     |
|--------------------|------|------------|-------|
| PPV (mm/s)         | 0.19 | 0.13       | 0.13  |
| FREQ (Hz)          | .4   | 250.0      | 166.7 |
| Peak Air Pressure: |      |            |       |
| Sample Size:       |      | 1440       |       |
| Interval Size:     |      | 60 seconds |       |



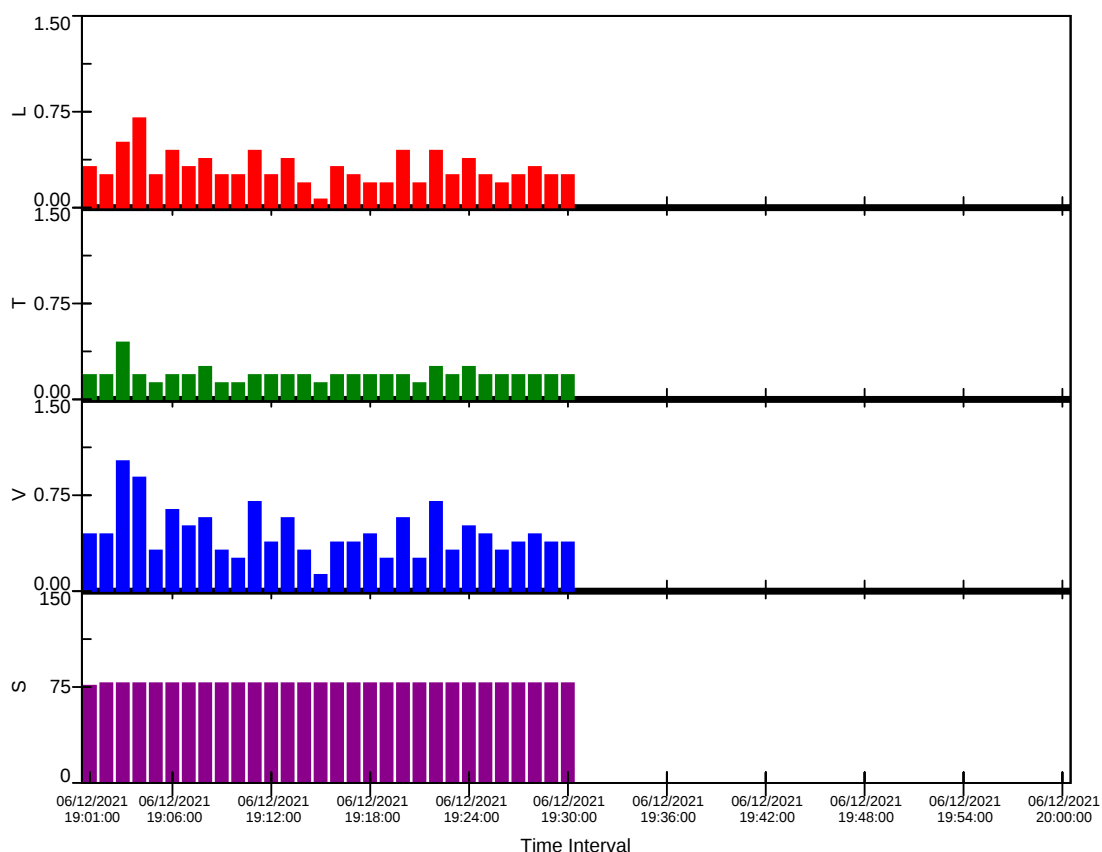
**Serial No:** 2215 v2.75  
**Date:** 06/12/2021 12:17:00  
**Event No:** 7  
**Record Time:** 30 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM13 – Policía Nacional  
**Distance:**  
**Operator:** L. Santamaría  
**Comment:**

**Continuous Monitor Recording Summary Data**  

|                    | L    | T          | V    |
|--------------------|------|------------|------|
| PPV (mm/s)         | 0.38 | 0.25       | 0.64 |
| FREQ (Hz)          | 12.2 | 12.2       | 8.6  |
| Peak Air Pressure: |      |            |      |
| Sample Size:       |      | 1440       |      |
| Interval Size:     |      | 60 seconds |      |

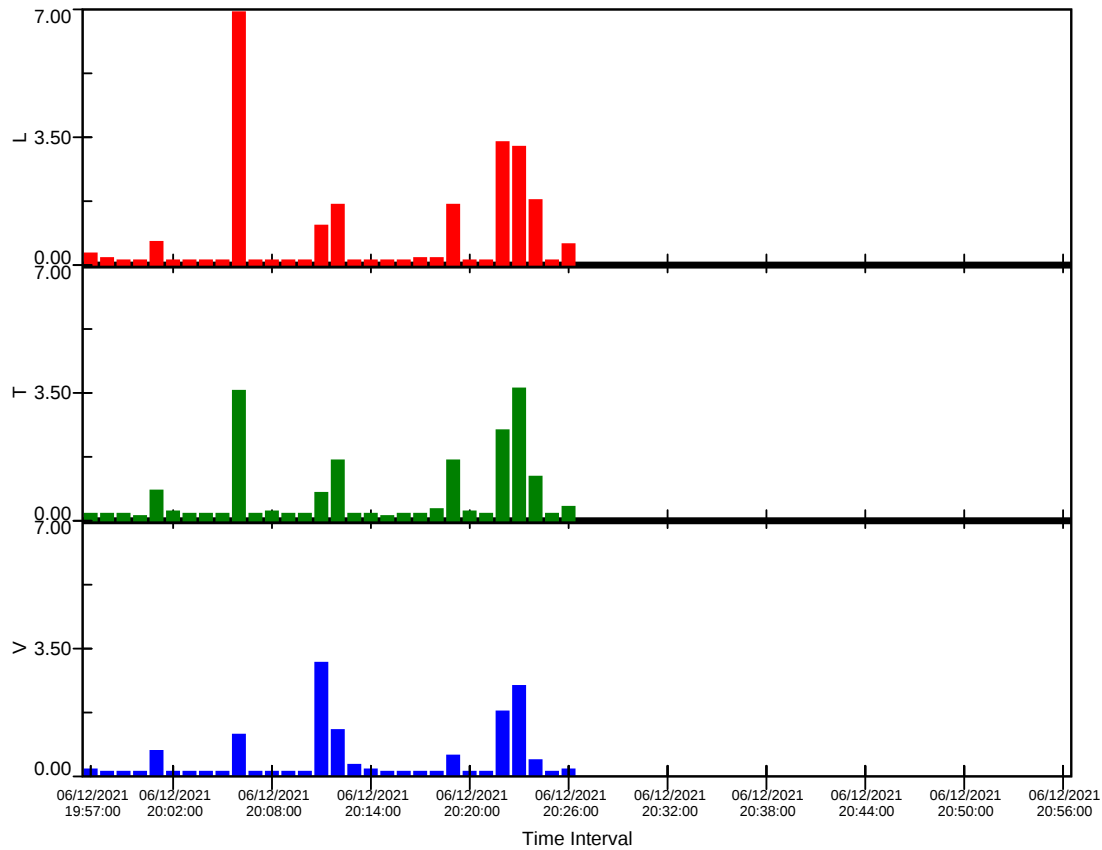


|                     |                                 |                                                  |            |          |
|---------------------|---------------------------------|--------------------------------------------------|------------|----------|
| <b>Serial No:</b>   | 2215 v2.75                      | <b>Continuous Monitor Recording Summary Data</b> |            |          |
| <b>Date:</b>        | 06/12/2021 19:01:00             | <b>L</b>                                         | <b>T</b>   | <b>V</b> |
| <b>Event No:</b>    | 8                               | 0.70                                             | 0.44       | 1.02     |
| <b>Record Time:</b> | 30 minutes                      | <b>PPV (mm/s)</b>                                |            |          |
| <b>Client:</b>      | CSA Group                       | <b>FREQ (Hz)</b>                                 | 10.4       | 9.8      |
| <b>Operation:</b>   | Corp. Quality Services          |                                                  |            | 8.8      |
| <b>Location:</b>    | EM1 B – Campamento Oeste 5K+800 | <b>Peak Air Pressure:</b>                        |            |          |
| <b>Distance:</b>    |                                 | <b>Sample Size:</b>                              | 1440       |          |
| <b>Operator:</b>    | L. Santamaría                   | <b>Interval Size:</b>                            | 60 seconds |          |
| <b>Comment:</b>     |                                 |                                                  |            |          |



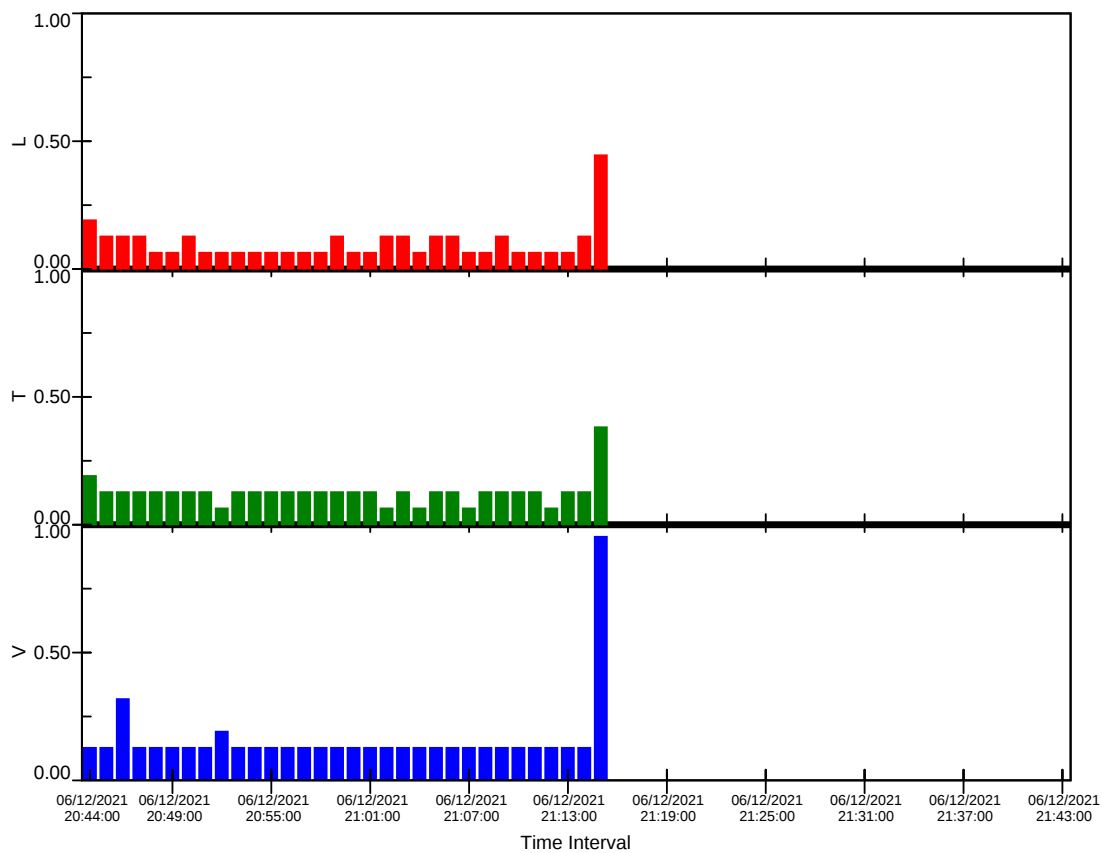
**Serial No:** 2215 v2.75  
**Date:** 06/12/2021 19:57:00  
**Event No:** 4  
**Record Time:** 30 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM6 – Campamento Oeste 5K+200  
**Distance:**  
**Operator:** L. Santamaría  
**Comment:**

| Continuous Monitor Recording Summary Data |            |      |       |
|-------------------------------------------|------------|------|-------|
|                                           | L          | T    | V     |
| PPV (mm/s)                                | 0.32       | 0.25 | 0.32  |
| FREQ (Hz)                                 | 3.4        | 13.5 | 125.0 |
| Peak Air Pressure:                        | NA         |      |       |
| Sample Size:                              | 1440       |      |       |
| Interval Size:                            | 60 seconds |      |       |



**Serial No:** 2215 v2.75  
**Date:** 06/12/2021 20:44:00  
**Event No:** 5  
**Record Time:** 32 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM13 – Policia Nacional  
**Distance:**  
**Operator:**  
**Comment:**

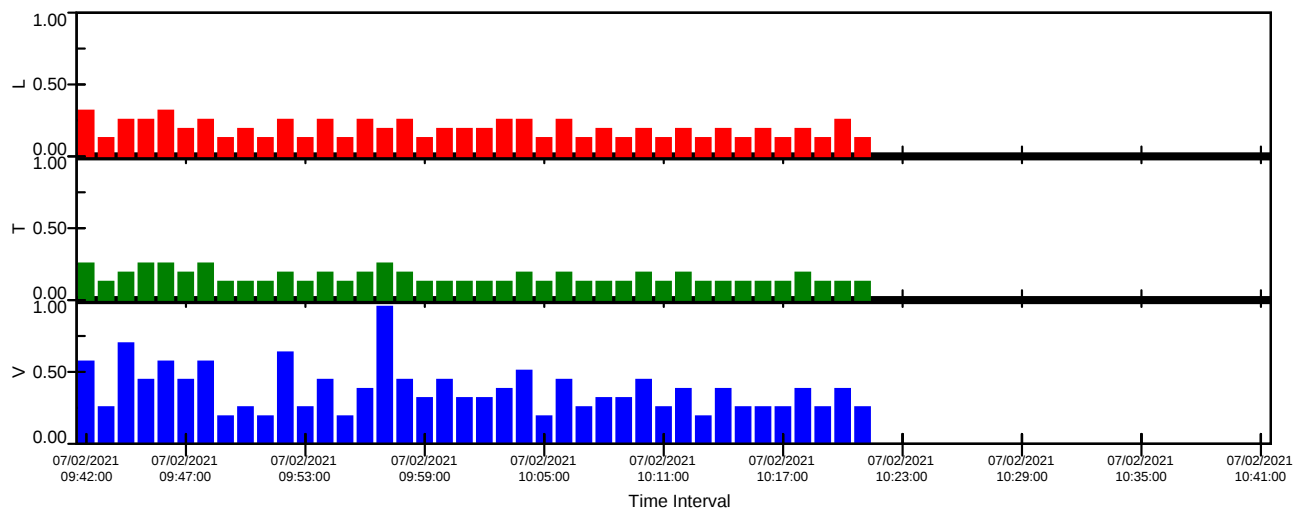
|                           | Continuous Monitor Recording<br>Summary Data |      |      |
|---------------------------|----------------------------------------------|------|------|
|                           | L                                            | T    | V    |
| <b>PPV (mm/s)</b>         | 0.19                                         | 0.19 | 0.19 |
| <b>FREQ (Hz)</b>          | 0.4                                          | 0.6  | 100  |
| <b>Peak Air Pressure:</b> | NA                                           |      |      |
| <b>Sample Size:</b>       | 1440                                         |      |      |
| <b>Interval Size:</b>     | 60 seconds                                   |      |      |



**Serial No:** 2215 v2.75  
**Date:** 07/02/2021 09:42:00  
**Event No:** 1  
**Record Time:** 40 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM11 – Edificio 69 ACP  
**Distance:**  
**Operator:**  
**Comment:**

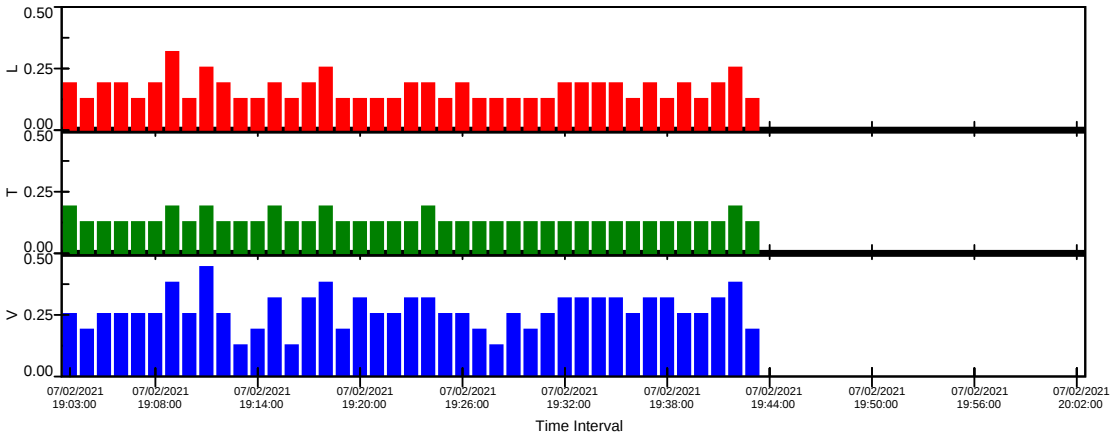
### Continuous Monitor Recording Summary Data

|                           | L          | T     | V     |
|---------------------------|------------|-------|-------|
| <b>PPV (mm/s)</b>         | 0.318      | 0.254 | 0.953 |
| <b>FREQ (Hz)</b>          | 10.0       | 8.9   | 3.7   |
| <b>Peak Air Pressure:</b> | NA         |       |       |
| <b>Sample Size:</b>       | 1440       |       |       |
| <b>Interval Size:</b>     | 60 seconds |       |       |



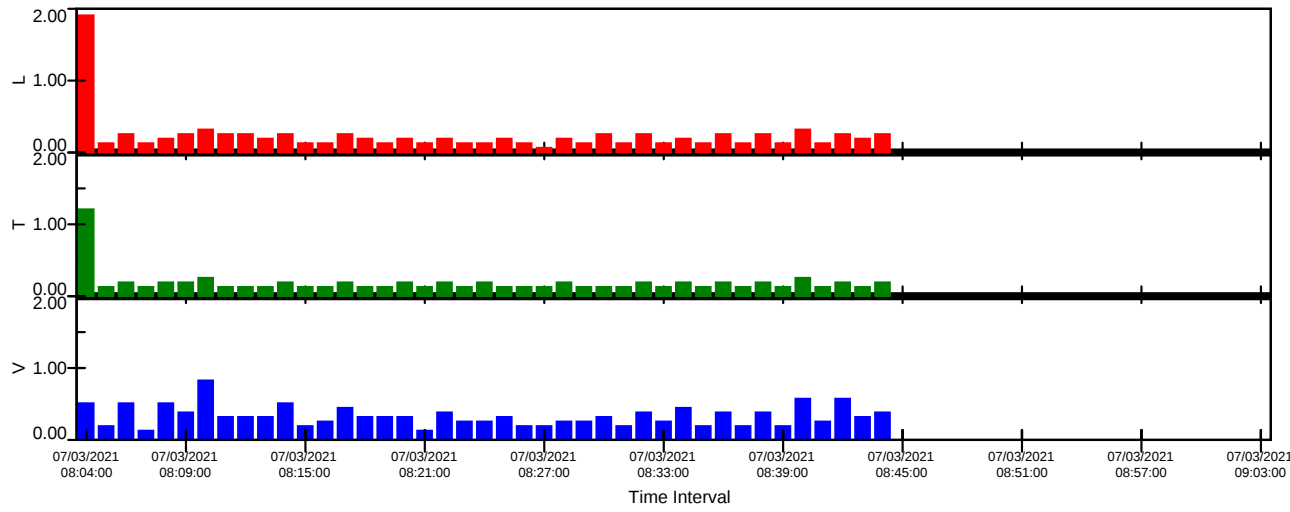
**Serial No:** 2215 v2.75  
**Date:** 07/02/2021 19:03:00  
**Event No:** 2  
**Record Time:** 41 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM11 – Edificio 69 ACP  
**Distance:**  
**Operator:**

| Continuous Monitor Recording Summary Data |            |       |       |
|-------------------------------------------|------------|-------|-------|
|                                           | L          | T     | V     |
| PPV (mm/s)                                | 0.318      | 0.191 | 0.445 |
| FREQ (Hz)                                 | 10.4       | 31.1  | 7.8   |
| Peak Air Pressure:                        | NA         |       |       |
| Sample Size:                              | 1440       |       |       |
| Interval Size:                            | 60 seconds |       |       |



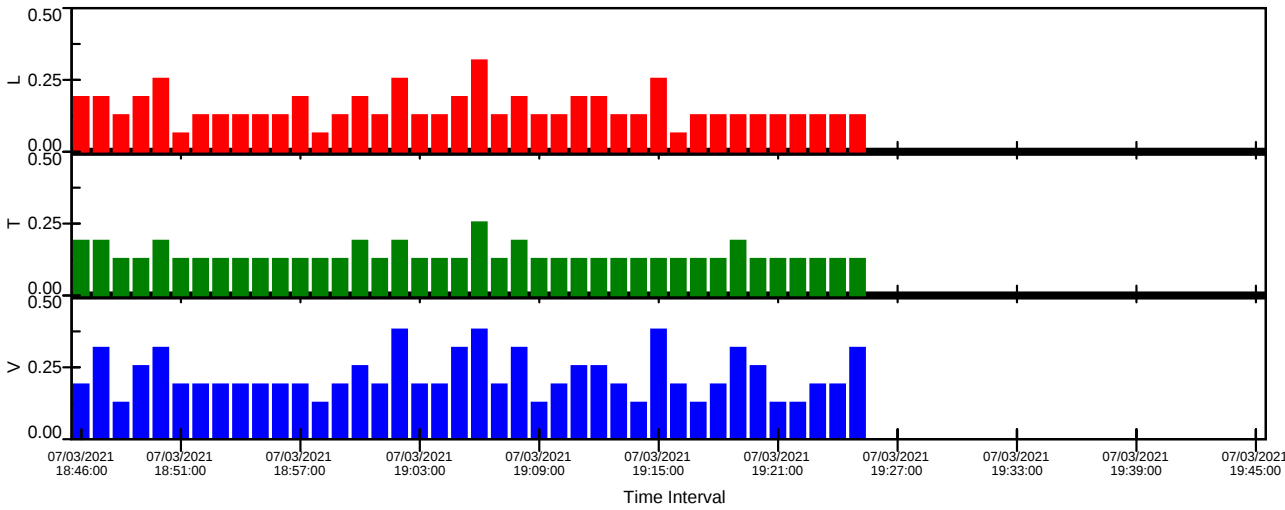
**Serial No:** 2215 v2.75  
**Date:** 07/03/2021 08:04:00  
**Event No:** 3  
**Record Time:** 41 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM11 – Edificio 69 ACP  
**Distance:**  
**Operator:**  
**Comment:**

| Continuous Monitor Recording Summary Data |            |       |       |
|-------------------------------------------|------------|-------|-------|
|                                           | L          | T     | V     |
| PPV (mm/s)                                | 1.905      | 1.207 | 0.826 |
| FREQ (Hz)                                 | 250.0      | 166.7 | 4.4   |
| Peak Air Pressure:                        | NA         |       |       |
| Sample Size:                              | 1440       |       |       |
| Interval Size:                            | 60 seconds |       |       |

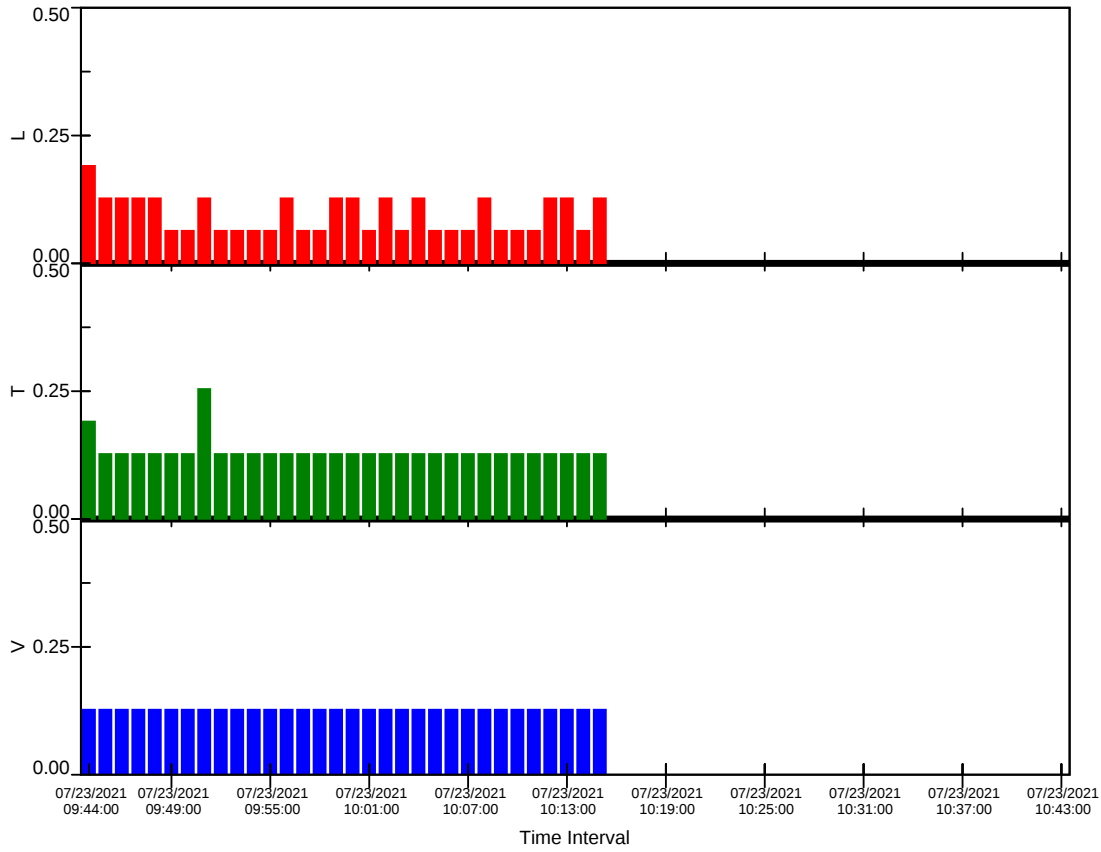


**Serial No:** 2215 v2.75  
**Date:** 07/03/2021 18:46:00  
**Event No:** 4  
**Record Time:** 40 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM11 – Edificio 69 ACP  
**Distance:**  
**Operator:**  
**Comment:**

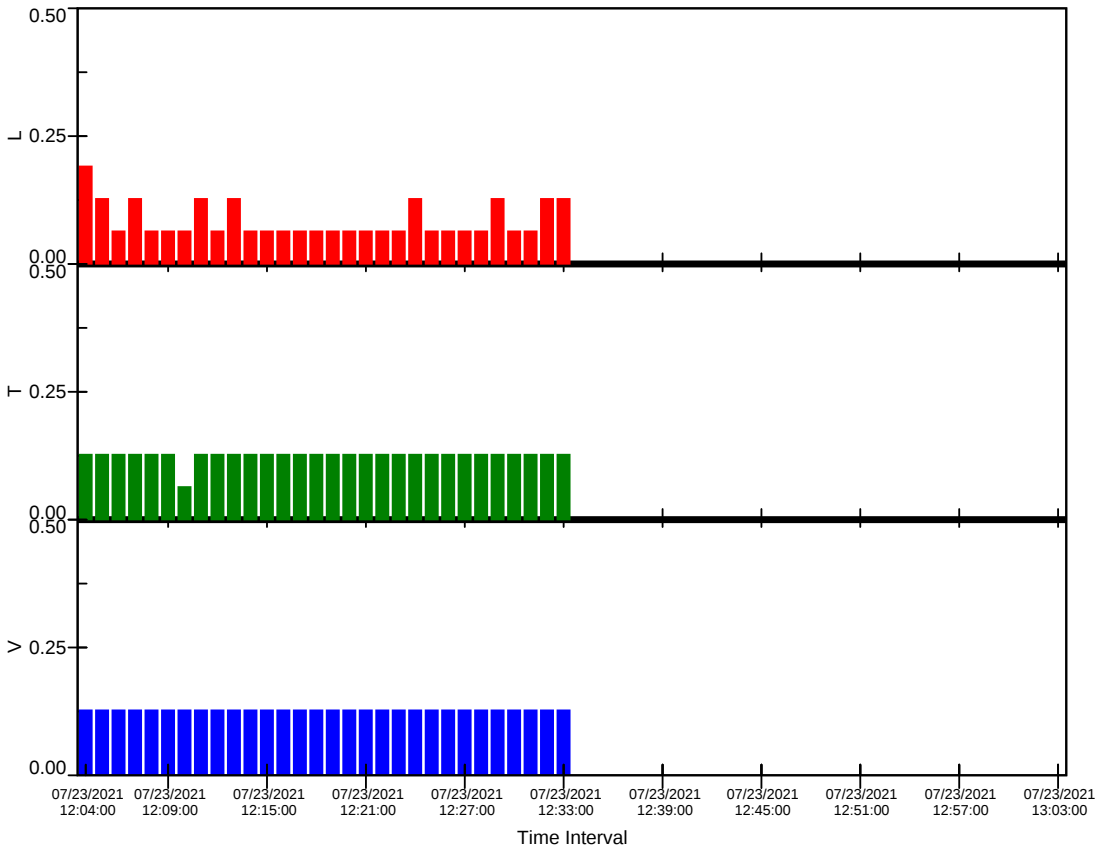
| Continuous Monitor Recording |            |       |       |
|------------------------------|------------|-------|-------|
| Summary Data                 |            |       |       |
|                              | L          | T     | V     |
| PPV (mm/s)                   | 0.254      | 0.191 | 0.381 |
| FREQ (Hz)                    | 15.2       | 41.7  | 11.1  |
| Peak Air Pressure:           | NA         |       |       |
| Sample Size:                 | 1440       |       |       |
| Interval Size:               | 60 seconds |       |       |



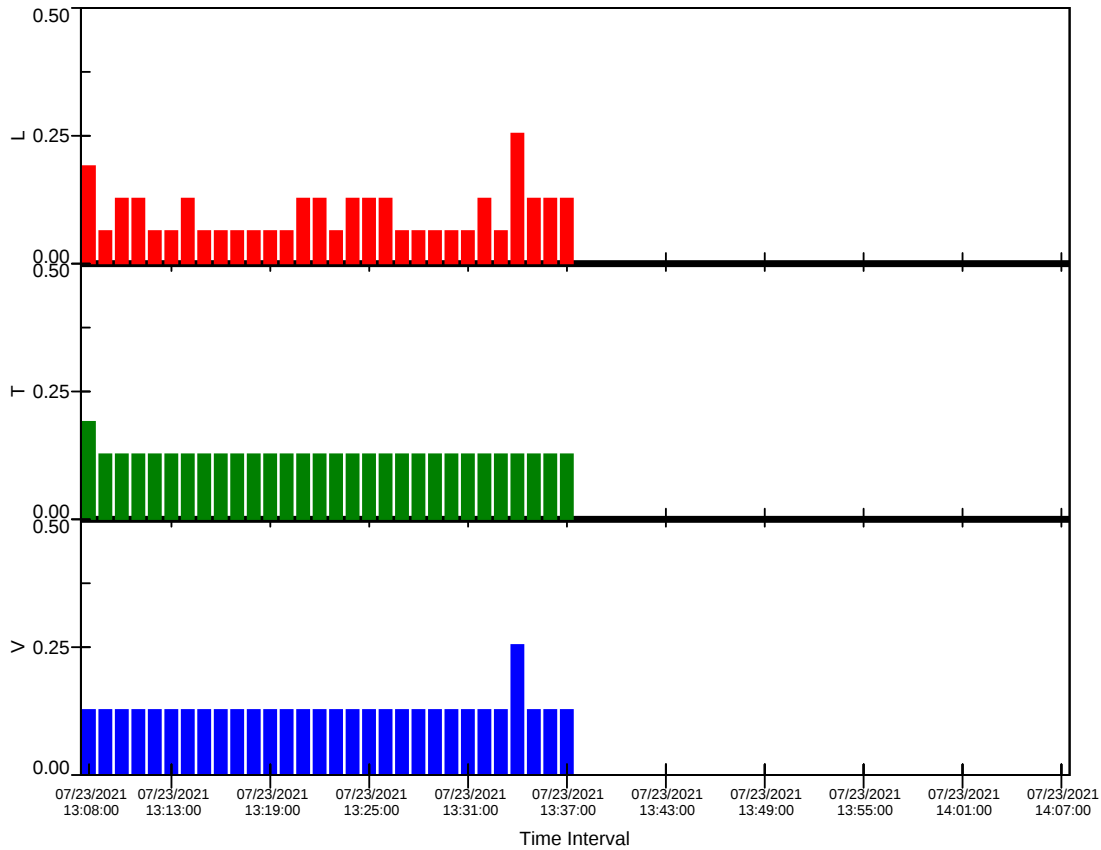
|              |                                        |                              |            |      |
|--------------|----------------------------------------|------------------------------|------------|------|
| Serial No:   | 2215 v2.75                             | Continuous Monitor Recording |            |      |
| Date:        | 07/23/2021 09:44:00                    | Summary Data                 |            |      |
| Event No:    | 1                                      | L                            | T          | V    |
| Record Time: | 32 minutes                             | PPV (mm/s)                   | 0.19       | 0.25 |
| Client:      | CSA Group                              | FREQ (Hz)                    | .4         | 0.13 |
| Operation:   | Corp. Quality Services                 |                              | 166.7      | 250  |
| Location:    | EM8 B – Sitio de Disposición de Farfán | Peak Air Pressure:           | NA         |      |
| Distance:    |                                        | Sample Size:                 | 1440       |      |
| Operator:    | L. Santamaría                          | Interval Size:               | 60 seconds |      |
| Comment:     |                                        |                              |            |      |



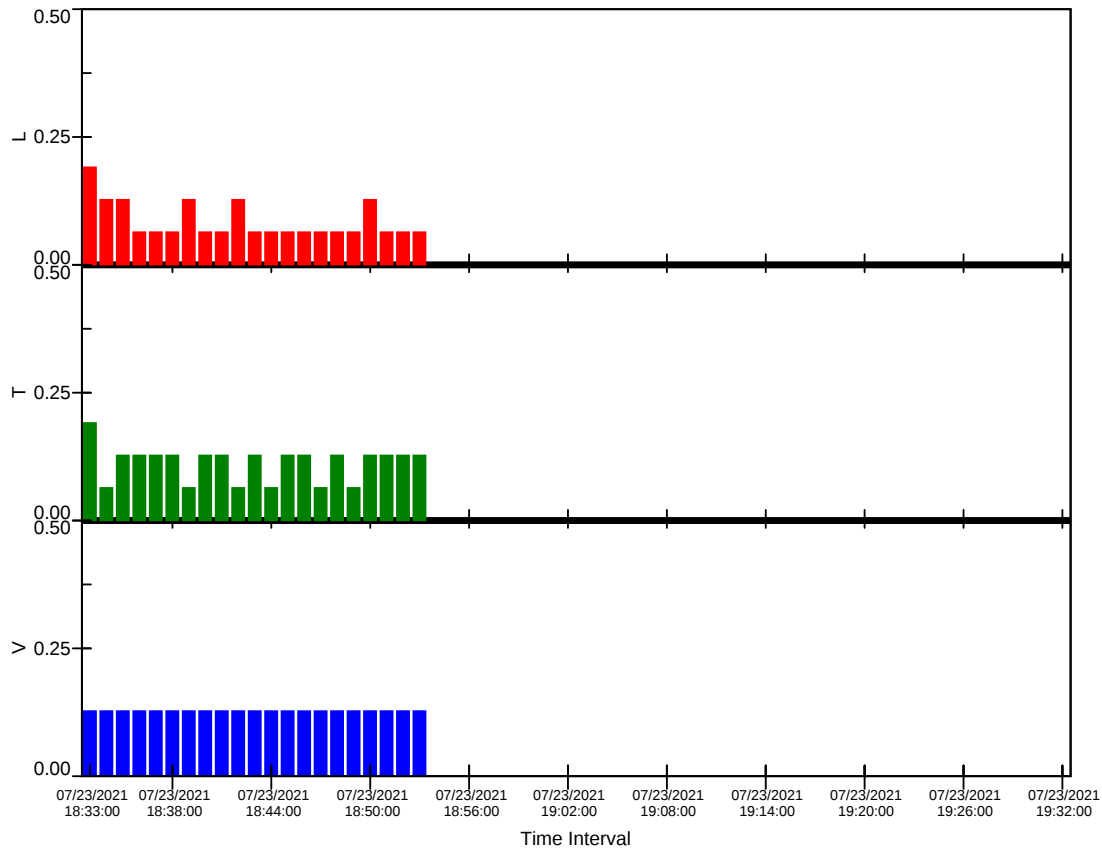
|              |                                        |                              |                    |       |       |
|--------------|----------------------------------------|------------------------------|--------------------|-------|-------|
| Serial No:   | 2215 v2.75                             | Continuous Monitor Recording |                    |       |       |
| Date:        | 07/23/2021 12:04:00                    | Summary Data                 |                    |       |       |
| Event No:    | 2                                      | L                            | T                  | V     |       |
| Record Time: | 30 minutes                             | PPV (mm/s)                   | 0.19               | 0.13  | 0.13  |
| Client:      | CSA Group                              | FREQ (Hz)                    | .5                 | 250.0 | 100.0 |
| Operation:   | Corp. Quality Services                 |                              |                    |       |       |
| Location:    | EM8 C – Nueva Vida (Hogar de Ancianos) |                              | Peak Air Pressure: | NA    |       |
| Distance:    |                                        | Sample Size:                 | 1440               |       |       |
| Operator:    | L. Santamaría                          | Interval Size:               | 60 seconds         |       |       |
| Comment:     |                                        |                              |                    |       |       |



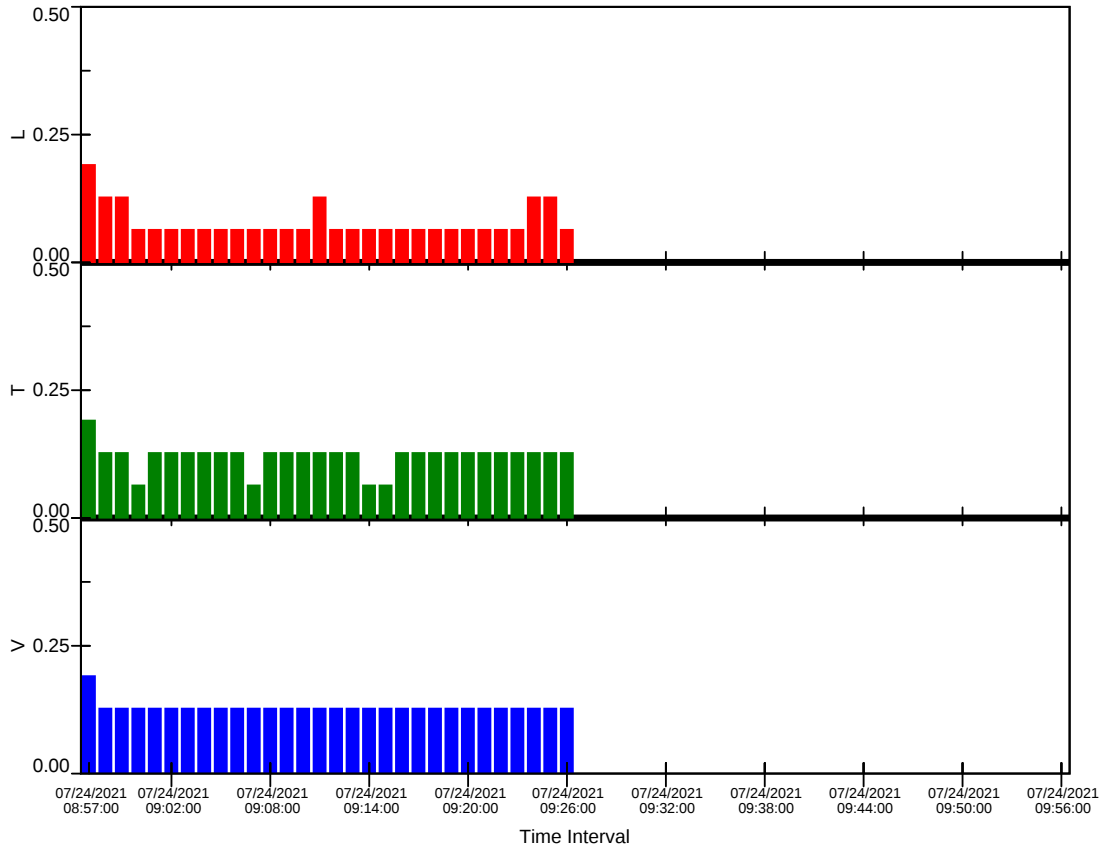
|                     |                                |                                     |            |          |
|---------------------|--------------------------------|-------------------------------------|------------|----------|
| <b>Serial No:</b>   | 2215 v2.75                     | <b>Continuous Monitor Recording</b> |            |          |
| <b>Date:</b>        | 07/23/2021 13:08:00            | <b>Summary Data</b>                 |            |          |
| <b>Event No:</b>    | 3                              | <b>L</b>                            | <b>T</b>   | <b>V</b> |
| <b>Record Time:</b> | 30 minutes                     | <b>PPV (mm/s)</b>                   | 0.19       | 0.19     |
| <b>Client:</b>      |                                | <b>FREQ (Hz)</b>                    | 0.4        | 1.4      |
| <b>Operation:</b>   |                                |                                     |            | 166.7    |
| <b>Location:</b>    | EM8 D – Nueva Vida (Guardería) | <b>Peak Air Pressure:</b>           | NA         |          |
| <b>Distance:</b>    |                                | <b>Sample Size:</b>                 | 1440       |          |
| <b>Operator:</b>    |                                | <b>Interval Size:</b>               | 60 seconds |          |
| <b>Comment:</b>     |                                |                                     |            |          |



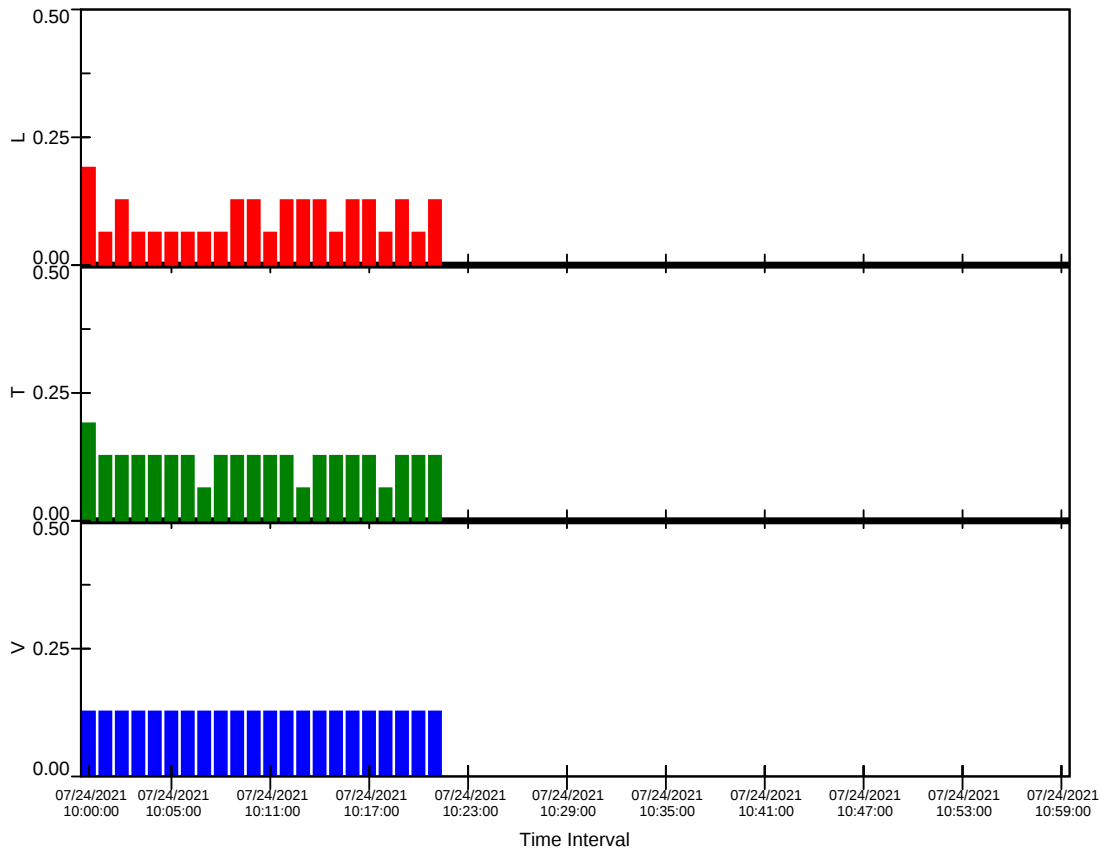
|                     |                                        |                                     |            |          |
|---------------------|----------------------------------------|-------------------------------------|------------|----------|
| <b>Serial No:</b>   | 3532 v2.75                             | <b>Continuous Monitor Recording</b> |            |          |
| <b>Date:</b>        | 07/23/2021 18:33:00                    | <b>Summary Data</b>                 |            |          |
| <b>Event No:</b>    | 4                                      | <b>L</b>                            | <b>T</b>   | <b>V</b> |
| <b>Record Time:</b> | 21 minutes                             | 0.19                                | 0.19       | 0.13     |
| <b>Client:</b>      | CSA Group                              | <b>PPV (mm/s)</b>                   |            |          |
|                     | 125.0                                  | <b>FREQ (Hz)</b>                    | .9         | 1.4      |
| <b>Operation:</b>   | Corp. Quality Services                 | <b>Peak Air Pressure:</b>           | NA         |          |
| <b>Location:</b>    | EM8 B – Sitio de Disposición de Farfán | <b>Sample Size:</b>                 | 1440       |          |
| <b>Distance:</b>    |                                        | <b>Interval Size:</b>               | 60 seconds |          |
| <b>Operator:</b>    | L. Santamaría                          |                                     |            |          |
| <b>Comment:</b>     |                                        |                                     |            |          |



|              |                                        |                              |      |            |      |
|--------------|----------------------------------------|------------------------------|------|------------|------|
| Serial No:   | 2215 v2.75                             | Continuous Monitor Recording |      |            |      |
| Date:        | 07/24/2021 08:57:00                    | Summary Data                 |      |            |      |
| Event No:    | 5                                      | L                            | T    | V          |      |
| Record Time: | 30 minutes                             | PPV (mm/s)                   | 0.19 | 0.19       | 0.19 |
| Client:      | CSA Group                              | FREQ (Hz)                    | .4   | .9         | .8   |
| Operation:   | Corp. Quality Services                 |                              |      |            |      |
| Location:    | EM8 B – Sitio de Disposición de Farfán | Peak Air Pressure:           |      | NA         |      |
| Distance:    |                                        | Sample Size:                 |      | 1440       |      |
| Operator:    | L. Santamaría                          | Interval Size:               |      | 60 seconds |      |
| Comment:     |                                        |                              |      |            |      |



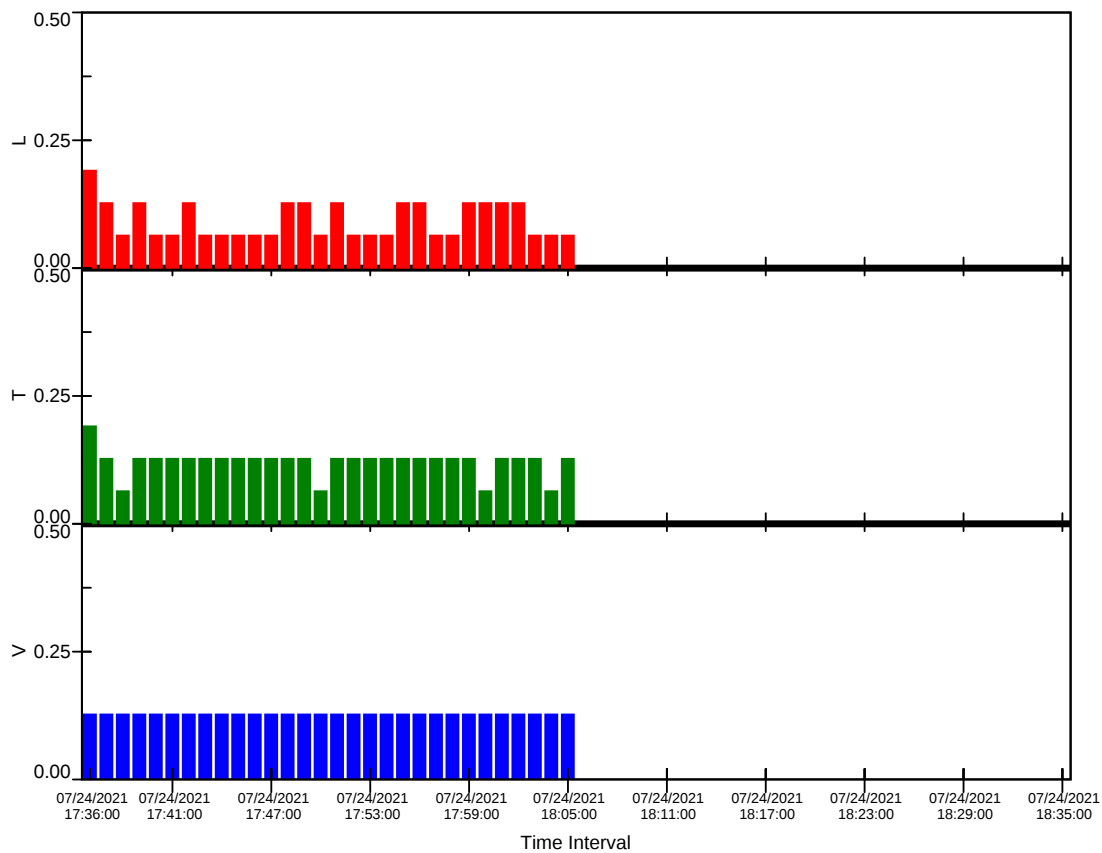
|                     |                                        |                                     |            |          |
|---------------------|----------------------------------------|-------------------------------------|------------|----------|
| <b>Serial No:</b>   | 2215 v2.75                             | <b>Continuous Monitor Recording</b> |            |          |
| <b>Date:</b>        | 07/24/2021 10:00:00                    | <b>Summary Data</b>                 |            |          |
| <b>Event No:</b>    | 6                                      | <b>L</b>                            | <b>T</b>   | <b>V</b> |
| <b>Record Time:</b> | 30 minutes                             | 0.19                                | 0.19       | 0.13     |
| <b>Client:</b>      | CSA Group                              | <b>PPV (mm/s)</b>                   |            |          |
| <b>Operation:</b>   | Corp. Quality Services                 | <b>FREQ (Hz)</b>                    | .4         | 1.1      |
| <b>Location:</b>    | EM8 C – Nueva Vida (Hogar de Ancianos) | <b>Peak Air Pressure:</b>           |            | 125.0    |
| <b>Distance:</b>    |                                        | <b>Sample Size:</b>                 | NA         |          |
| <b>Operator:</b>    | L. Santamaría                          | <b>Interval Size:</b>               | 1440       |          |
| <b>Comment:</b>     |                                        |                                     | 60 seconds |          |



**Serial No:** 2215 v2.75  
**Date:** 07/24/2021 17:36:00  
**Event No:** 7  
**Record Time:** 30 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM8 D – Nueva Vida (Guardería)  
**Distance:**  
**Operator:** L. Santamaría  
**Comment:**

### Continuous Monitor Recording Summary Data

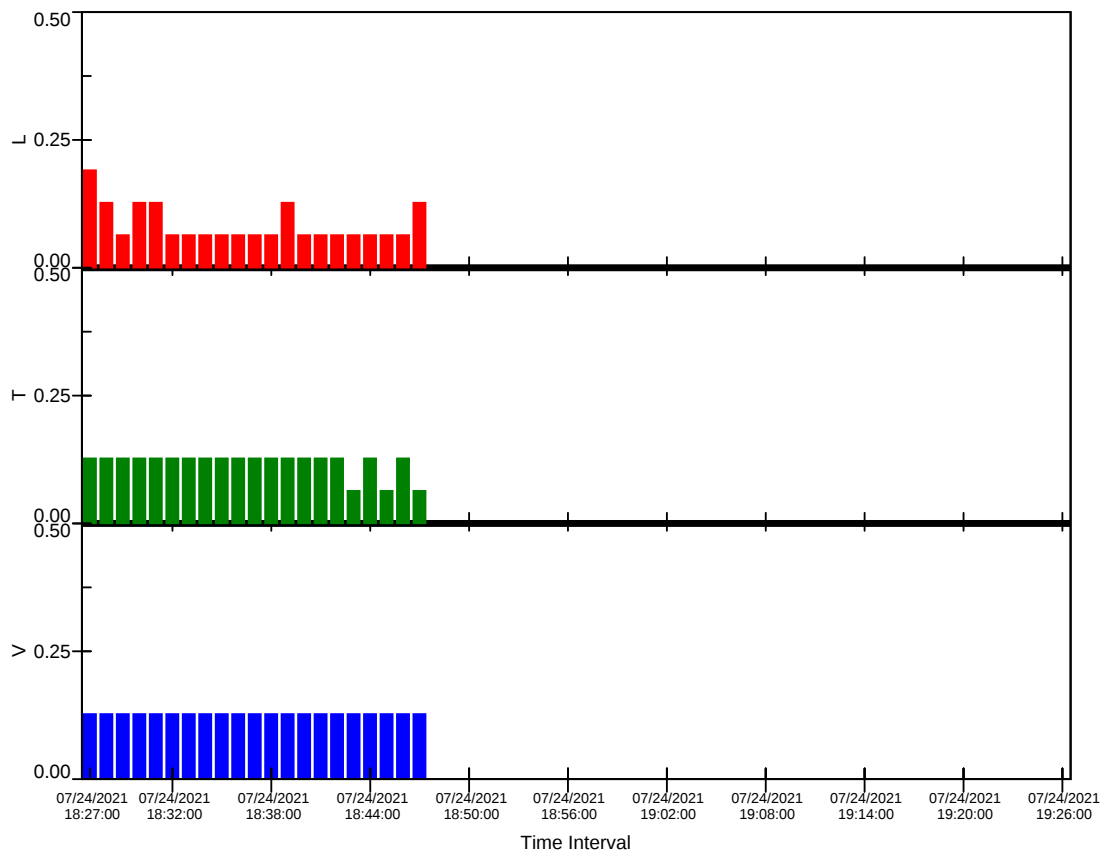
|                           |            |          |          |
|---------------------------|------------|----------|----------|
|                           | <b>L</b>   | <b>T</b> | <b>V</b> |
| <b>PPV (mm/s)</b>         | 0.19       | 0.19     | 0.13     |
| <b>FREQ (Hz)</b>          | .4         | .7       | 166.7    |
| <b>Peak Air Pressure:</b> | NA         |          |          |
| <b>Sample Size:</b>       | 1440       |          |          |
| <b>Interval Size:</b>     | 60 seconds |          |          |



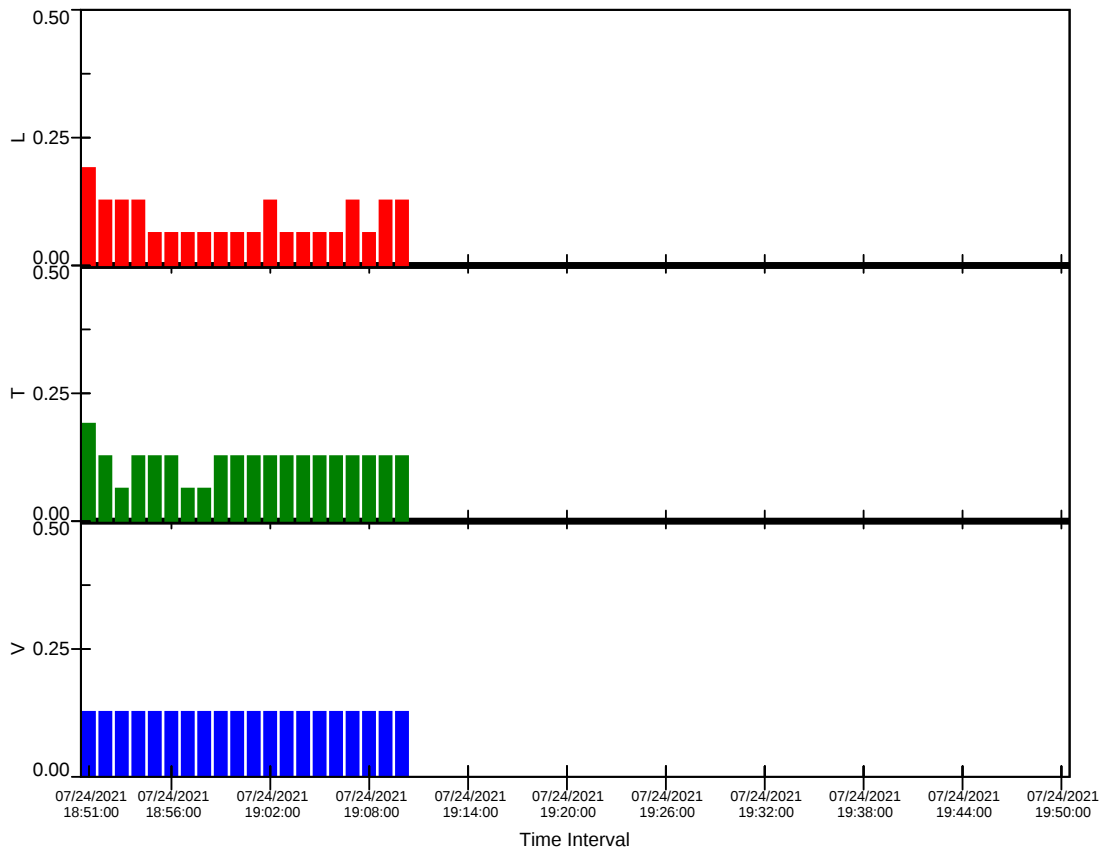
**Serial No:** 2215 v2.75  
**Date:** 07/24/2021 18:27:00  
**Event No:** 8  
**Record Time:** 21 minutes  
**Client:** CSA Group  
**Operation:** Corp. Quality Services  
**Location:** EM8 D – Nueva Vida (Guardería)  
**Distance:**  
**Operator:** L. Santamaría  
**Comment:**

**Continuous Monitor Recording  
Summary Data**

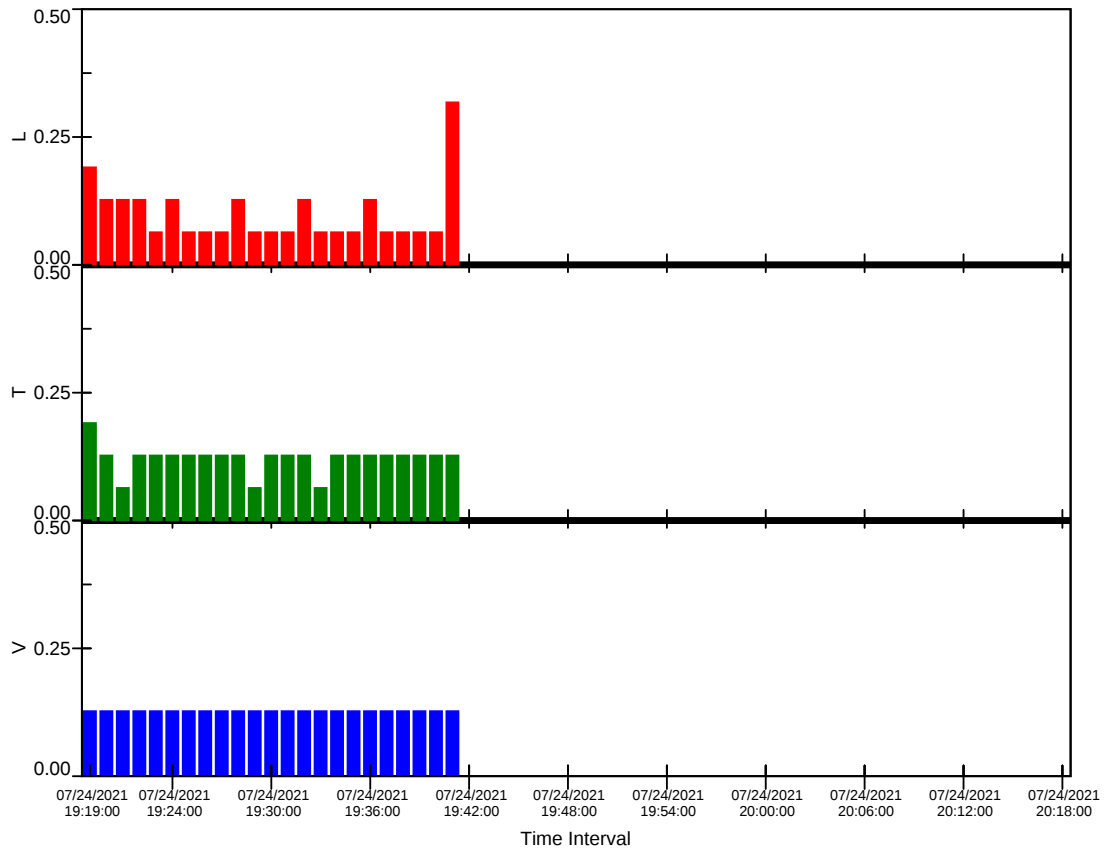
|                           |          |            |          |
|---------------------------|----------|------------|----------|
|                           | <b>L</b> | <b>T</b>   | <b>V</b> |
| <b>PPV (mm/s)</b>         | 0.19     | 0.13       | 0.13     |
| <b>FREQ (Hz)</b>          | .4       | 255.0      | 166.7    |
| <b>Peak Air Pressure:</b> |          | NA         |          |
| <b>Sample Size:</b>       |          | 1440       |          |
| <b>Interval Size:</b>     |          | 60 seconds |          |



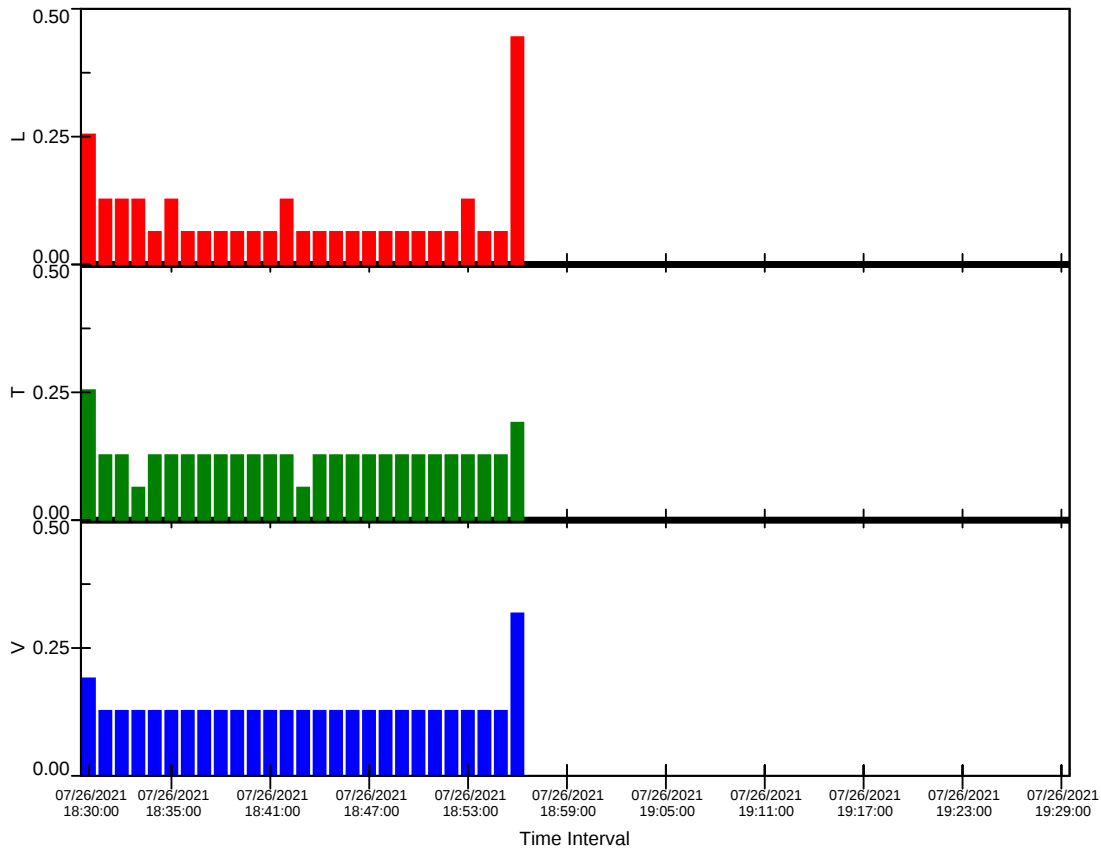
|                     |                                        |                                     |            |          |
|---------------------|----------------------------------------|-------------------------------------|------------|----------|
| <b>Serial No:</b>   | 2215 v2.75                             | <b>Continuous Monitor Recording</b> |            |          |
| <b>Date:</b>        | 07/24/2021 18:51:00                    | <b>Summary Data</b>                 |            |          |
| <b>Event No:</b>    | 9                                      | <b>L</b>                            | <b>T</b>   | <b>V</b> |
| <b>Record Time:</b> | 20 minutes                             | 0.19                                | 0.19       | 0.13     |
| <b>Client:</b>      | CSA Group                              | <b>PPV (mm/s)</b>                   |            |          |
| <b>Operation:</b>   | Corp. Quality Services                 | <b>FREQ (Hz)</b>                    | .5         | .7       |
| <b>Location:</b>    | EM8 C – Nueva Vida (Hogar de Ancianos) | <b>Peak Air Pressure:</b>           |            | 166.7    |
| <b>Distance:</b>    |                                        | <b>Sample Size:</b>                 | NA         |          |
| <b>Operator:</b>    | L. Santamaría                          | <b>Interval Size:</b>               | 1440       |          |
| <b>Comment:</b>     |                                        |                                     | 60 seconds |          |



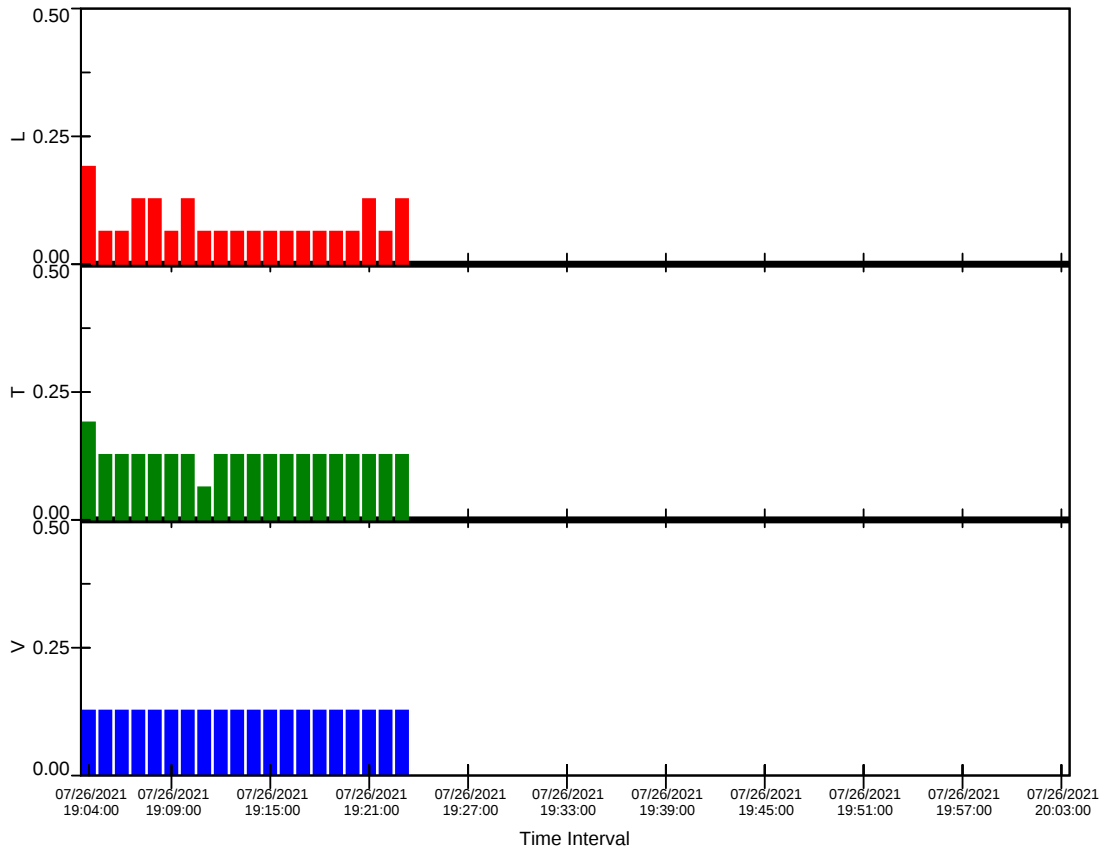
|                     |                                        |                                     |            |          |
|---------------------|----------------------------------------|-------------------------------------|------------|----------|
| <b>Serial No:</b>   | 2215 v2.75                             | <b>Continuous Monitor Recording</b> |            |          |
| <b>Date:</b>        | 07/24/2021 19:19:00                    | <b>Summary Data</b>                 |            |          |
| <b>Event No:</b>    | 10                                     | <b>L</b>                            | <b>T</b>   | <b>V</b> |
| <b>Record Time:</b> | 30 minutes                             | 0.19                                | 0.19       | 0.13     |
| <b>Client:</b>      | CSA Group                              | <b>PPV (mm/s)</b>                   |            |          |
| <b>Operation:</b>   | Corp. Quality Services                 | <b>FREQ (Hz)</b>                    | .4         | .8       |
| <b>Location:</b>    | EM8 B – Sitio de Disposición de Farfán | <b>Peak Air Pressure:</b>           | NA         |          |
| <b>Distance:</b>    |                                        | <b>Sample Size:</b>                 | 1440       |          |
| <b>Operator:</b>    | L. Santamaría                          | <b>Interval Size:</b>               | 60 seconds |          |
| <b>Comment:</b>     |                                        |                                     |            |          |



|                     |                                        |                                     |            |          |
|---------------------|----------------------------------------|-------------------------------------|------------|----------|
| <b>Serial No:</b>   | 2215 v2.75                             | <b>Continuous Monitor Recording</b> |            |          |
| <b>Date:</b>        | 07/26/2021 18:30:00                    | <b>Summary Data</b>                 |            |          |
| <b>Event No:</b>    | 11                                     | <b>L</b>                            | <b>T</b>   | <b>V</b> |
| <b>Record Time:</b> | 27 minutes                             | <b>PPV (mm/s)</b>                   | 0.25       | 0.25     |
| <b>Client:</b>      | CSA Group                              | <b>FREQ (Hz)</b>                    | 100.0      | 83.3     |
| <b>Operation:</b>   | Corp. Quality Services                 | <b>Peak Air Pressure:</b>           | NA         |          |
| <b>Location:</b>    | EM8 C - Nueva Vida (Hogar de Ancianos) | <b>Sample Size:</b>                 | 1440       |          |
| <b>Distance:</b>    |                                        | <b>Interval Size:</b>               | 60 seconds |          |
| <b>Operator:</b>    | L. Santamaría                          |                                     |            |          |
| <b>Comment:</b>     |                                        |                                     |            |          |



|              |                                |                              |            |      |       |
|--------------|--------------------------------|------------------------------|------------|------|-------|
| Serial No:   | 2215 v2.75                     | Continuous Monitor Recording |            |      |       |
| Date:        | 07/26/2021 19:04:00            | Summary Data                 |            |      |       |
| Event No:    | 12                             | L                            | T          | V    |       |
| Record Time: | 20 minutes                     | PPV (mm/s)                   | 0.19       | 0.19 | 0.13  |
| Client:      | CSA Group                      | FREQ (Hz)                    | 5.5        | 1.0  | 250.0 |
| Operation:   | Corp. Quality Services         |                              |            |      |       |
| Location:    | EM8 D – Nueva Vida (Guardería) | Peak Air Pressure:           | NA         |      |       |
| Distance:    |                                | Sample Size:                 | 1440       |      |       |
| Operator:    | L. Santamaría                  | Interval Size:               | 60 seconds |      |       |
| Comment:     |                                |                              |            |      |       |



## MAPA DE ESTACIONES DE MONITOREO





