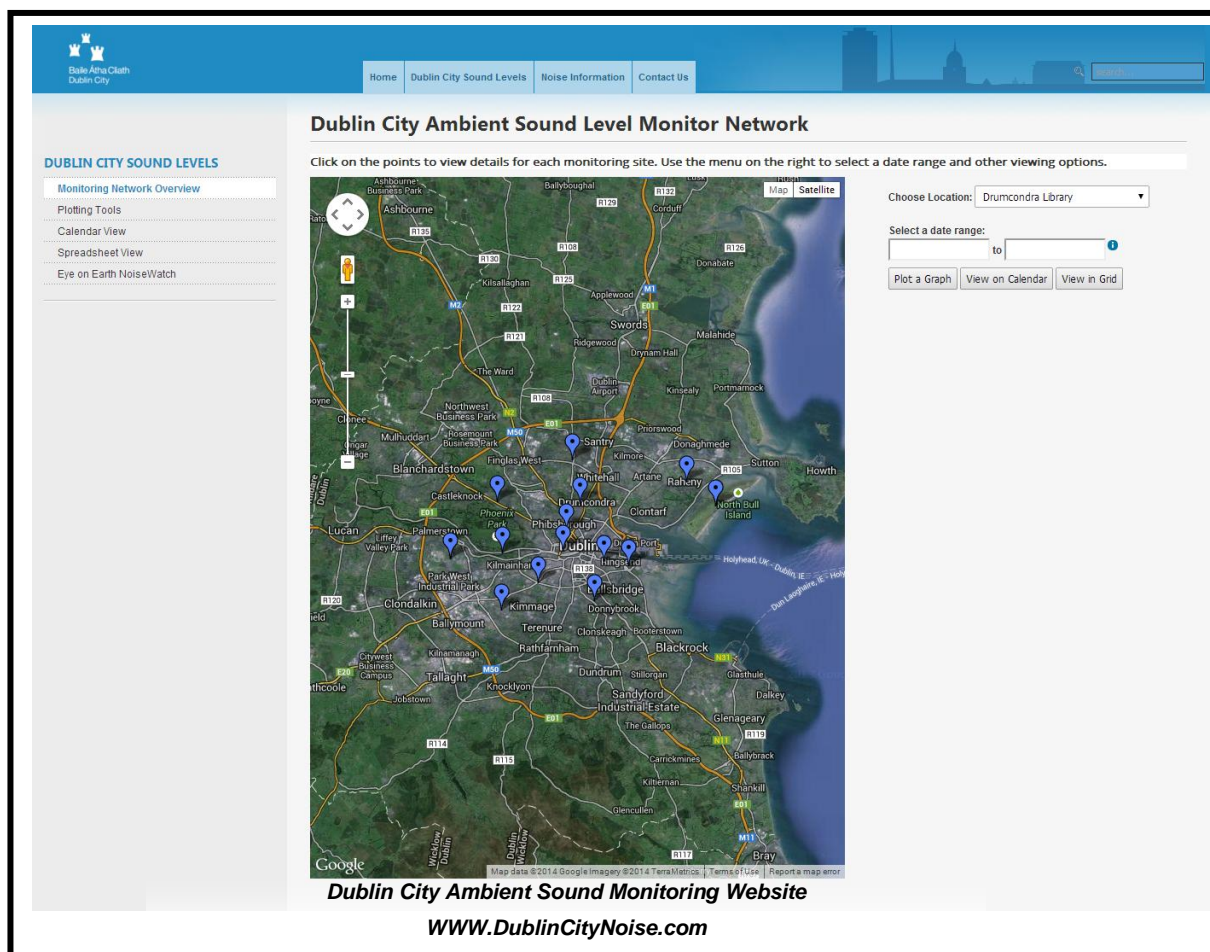


DUBLIN CITY COUNCIL

AMBIENT SOUND MONITORING NETWORK

Annual Report 2013



Produced by

Traffic Noise & Air Quality Unit

Roads and Traffic Department,

Dublin City Council

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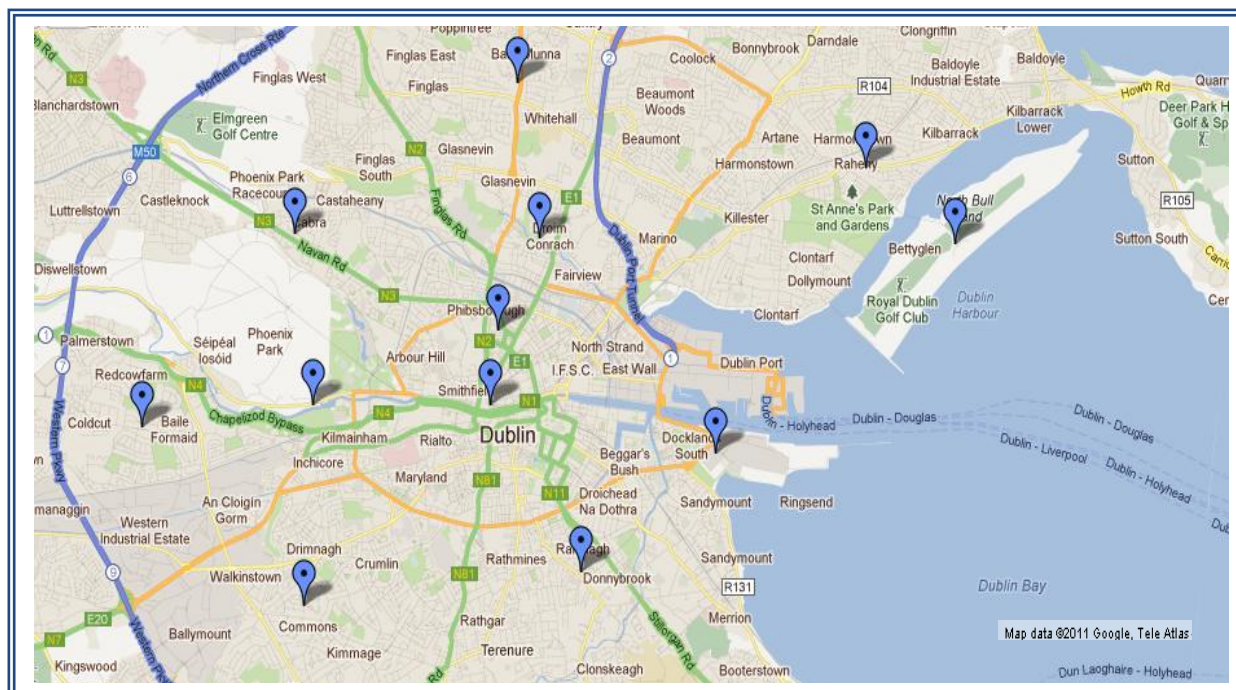
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Introduction

This is the fifth Annual Report for the Dublin Ambient Sound Monitoring Network. Dublin City Council commenced the installation of a permanent ambient sound monitoring network in 2009. Currently the monitoring network comprises of 12 sites. It is anticipated that there will 3 further site added to the network, subject to resource availability. The purpose of the network is to measure outdoor ambient sound levels in the City, at sites which are representative of typical sound levels to which citizens are being exposed.

Fig. 1 Sound Monitoring Sites -



It should be noted that sites are selected so that, in so far as is possible, no single dominant sound source, such as major roads, road junctions, industrial sources etc. have a disproportionate influence on the outdoor ambient sound levels being measured. The network currently consists of 12 monitoring locations. These are:-

- Ashtown, off Navan Rd. D7, Private House
- Ballyfermot Road, D10, Civic Centre
- Ballymun Road, D11, Library
- Bull Island, D3, Interpretative Centre
- Chapelizod Road, D8, Dublin City Council Rowing Club
- Howth Road, D5, Raheny Library
- Blessington St, D1, Blessington Basin.
- Millmount Avenue, D9, Drumcondra Library
- Percy French Road, D12, Walkinstown Library
- Ringsend, D4, Irishtown Stadium
- Woodstock Gardens, Ranelagh, D6, Snr. Citizens Residential Scheme
- Chancery Park, Dublin 1, Public Park,

Dublin City Council Sound Monitoring Website

As mentioned in last year's annual report, it was hoped, as part of the Noise Action Plan implementation process, to have a Dublin City Council website developed by the end of 2013 which would display and make available to the public more detailed information including near real time data arising from our monitoring network. This site was launched in the 2nd quarter of 2013. It was developed in collaboration with a Trinity College campus company – Sonitas Systems, who have also developed the hardware used in the monitoring network. Dublin City Council's collaboration over the years with Trinity College and Sonitas Systems has been of mutual benefit. We would like to feel that this collaboration has enabled Dublin City to be one of the leading cities, not just in Ireland but in Europe, in relation to making available information to the public on long term continuous ambient sound monitoring. We are currently the only city providing this data to the European Environment Agency's 'Noise Watch' crowd sourcing environmental website. Near real time monitoring data can be found at our website link: <http://www.dublincitynoise.com>. General information on noise, acoustics and associated links can also be found there.

Measurement Parameters

The European Commission requires the use of a parameter called the Lden (Sound Level for Day, Evening and Night) for population exposure assessment. This measurement parameter of *Day-evening-night level* is a descriptor of average daily sound levels throughout a full year, with the addition of a penalty of 5 dB(A) for evening sound (i.e. 19.00-23.00) and a penalty of 10 dB(A) for night time sound (23.00-7.00). Lden has been put forward as a single value parameter for the quantification of annoyance caused by noise.

The monitoring network measures continuously, 5 minute parcels of sound right throughout the year. These periods of 5 minute sound levels are then converted and presented as average hourly sound levels in decibels dB(A)). This enables the compilation of *day, evening, night, and Lden* statistics. This year the averaging of measured data has been carried out logarithmically rather than normal arithmetical averaging. This is in line with the International Standards Organisation 'Recommendation 1996' in relation to long term measurements. The use of this method tends to assign a greater influence on the overall average by higher sound levels for the period being measured. For example, and an arithmetical average of four sound levels such as 50dB, 50dB, 50dB and 70dB will result in a 55dB average. Averaged logarithmically these values produced a result of 64.1dB. Averages for 2012 have been recalculated in order to provide comparable data with 2013.

Guidelines\ Standards for exposure to Ambient Sound levels

Sound emission criteria for certain sources, outside of the work environment, can be applied and enforced through Integrated Pollution Prevention Control licences, Planning Control, or Section 107-108 of the Environmental Protection Agency Act 1992. There are no legally binding statutory limits for ambient sound levels, similar to those that currently exist for air quality.

Areas with desirable\undesirable or high\low sound levels

The Dublin City Council Noise Action Plan Oct 2008-Nov2013 proposes that areas with undesirable high sound levels are areas with a night time sound level greater than 55 decibels and a daytime level greater than 70 decibels. Areas with desirably low sound levels are defined as areas with a night time level less than 50 decibels and\or a daytime level less than 55 decibels. The review of the Noise Action Plan 2013-2018 did not change these criteria.

The World Health Organisation Night Noise Guidelines (NNGL) for Europe

These guidelines propose a **Night Noise Guideline (NNGL)** Lnight for outside = 40 dB; Interim target (IT) Lnight, outside = 55 dB.

Data Loss

Loss of data is mainly due to the drifting of the calibration of the microphones or power failure at a site. Data which could not be verified with a correct calibration was discarded. There was no instance of vandalism at any of the sites. This year some data had to be discarded due to dc adapter power supply failure at Raheny, Irishtown and Bull Island.

Sound Sources

Our measurements indicate, supported by computer modelling, that under normal conditions the dominant sound source in Dublin is traffic. This sound comes from two aspects of traffic – the road surface i.e. wheel\tyre interface where sound levels increase with speed and secondly, engine\ gear change and body rattle sound, normally observed at lower speeds. The impact of sound from traffic can be noted by observing the average daily summary charts (pages17-23). Most display a double peak, one between 7-9 a.m. and one between 5-7p.m. These characteristics are similarly to traffic flow patterns on major roads. The charts that do not reflect these characteristics represent areas that are influenced by more natural sounds – sites such as Bull Island.

Weather also has a major influence on our sound measurements. In 2013 very high winds and heavy rain were experienced over a number of periods throughout the year. These episodes are picked up as high sound levels in the hourly and monthly summary charts, (pages 29-98). Again this year, Bull Island measurements displayed relatively high sound levels during these weather episodes. It is therefore important to reiterate, that an increase in sound levels over a particular period may not necessarily mean an increase in ‘noise levels’ – noise being defined as unwanted sound.

The monitoring site locations are displayed on maps to the rear of this report and provide an indication as to the type of areas in which they are situated. Bull Island, as was previously mentioned, tends to be the most erratic site, in that there is no readily discernable pattern to the measured levels.

This site is impacted more by the time of the tides and weather rather than sounds from traffic and human activity. The Blessington Basin site was installed in order to validate computer model indications that this area could be deemed to be a 'Quiet Area'. It was subsequently nominated for delimiting as a quiet area by the Minister for Environment, Community & Local Government. This site was approved as a 'Quiet Area' in 2013 and the monitoring will continue into the foreseeable future in order to assess any deterioration in ambient sound levels.

Quiet Areas

During 2013, on foot of approval by the City Council, eight areas were forwarded to the Minister for Environment, Community & Local Government, for designation as Quiet Areas. They were approved by the Minister for designation in July 2013. These eight areas were:-

- Blessington Basin, Blessington St.
- Edenmore Park, Raheny.
- Mount Bernard Park, Shandon Park, Phibsborough.
- Dollymount SAA – Terrestrial Area Only(excluding sloblands)
- St. Annes Park, Raheny
- Palmerston Park, Dartry, (Relatively Quiet Area)
- Ranelagh Gardens, Ranelagh (Relatively Quiet Area)
- The Cabbage Patch, Cathedral Lane, D2, (Relatively Quiet Area).

It is not envisaged that these quiet areas will be required to be quiet in the same way as a library or church setting may be observed to be quiet. These are areas with low environmental sound levels, as identified by a computer noise modelling/mapping process, and which provide an opportunity for people to visit and recreate, away from areas with high environmental noise. Obviously the more people who take up this opportunity, the more 'noisier' it is going to get i.e. babies crying, children screaming and shouting while playing, and all other types of sound that people emit and cause, while engaged in social and recreational activities. However this type of sound is not defined as environmental noise. It is not the intention for this sort of 'noise' – for want of a better word, to be discouraged. Work that is required to be carried out in a quiet area - such as grass cutting with heavy tractors etc, is not deemed to be environmental noise either, and is therefore allowable. It is not intended for these areas to be put up on a pedestal with people looking in from afar, admiring how quiet it is. People are encouraged to use these areas, so in addition to all the other benefits of using the facilities of a park, they also get the added benefit of doing whatever they are doing in a tranquil and quiet setting. More details on 'Quiet Areas can be found on our website at:-

<http://www.dublincity.ie/WaterWasteEnvironment/NoiseMapsandActionPlans/Documents/ProposalQuietAreas.pdf>

Summary of Results

The measurements for the year 2013 indicate that three locations – Ballymun, Chancery Pk. and Bull Island exceeded the undesirable values of 55dB night/70dB day, with a night time values of 58dB(A), 58dB(A) and 63dB(A) respectively. This also

meant that the WHO NNGL interim target for exterior night time level of 55dB(A) was also exceeded at these sites, although the network average as a whole was below this level with a value of 53dB(A). One site – Woodstock Gardens in Ranelagh, met the desirable criteria for night time levels. All sites were well below the undesirable daytime levels of 70dB(A). Wood Stock Gardens, again, was the only site below the desirable daytime level of 55dB(A).

Bull Island's sound level is interesting in that this locality has been designated as a 'Quiet Area'. It is considered that the relatively high sound levels measured are due to high winds and wave sounds during the atypical weather events during the year. As already mentioned, the logarithmical averaging of sound measurements tends to assign a greater influence on the overall average by higher sound levels for the period being measured even if that period is as long as a year.

Set out in *fig.2* is a comparison of the Network averages for 2012 and 2013. The 1dB difference in the LDEN over 2012 is insignificant when the atypical weather conditions are taken into consideration.

This follows on from a marginal decrease of 0.5dB for 2012 over 2011 figures. Figure 3 provides more detail for the individual sites.

Fig.2

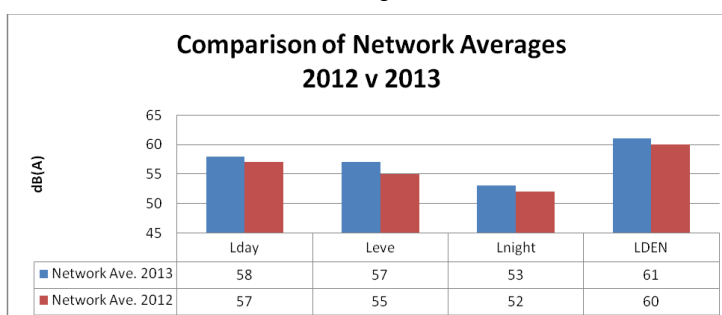
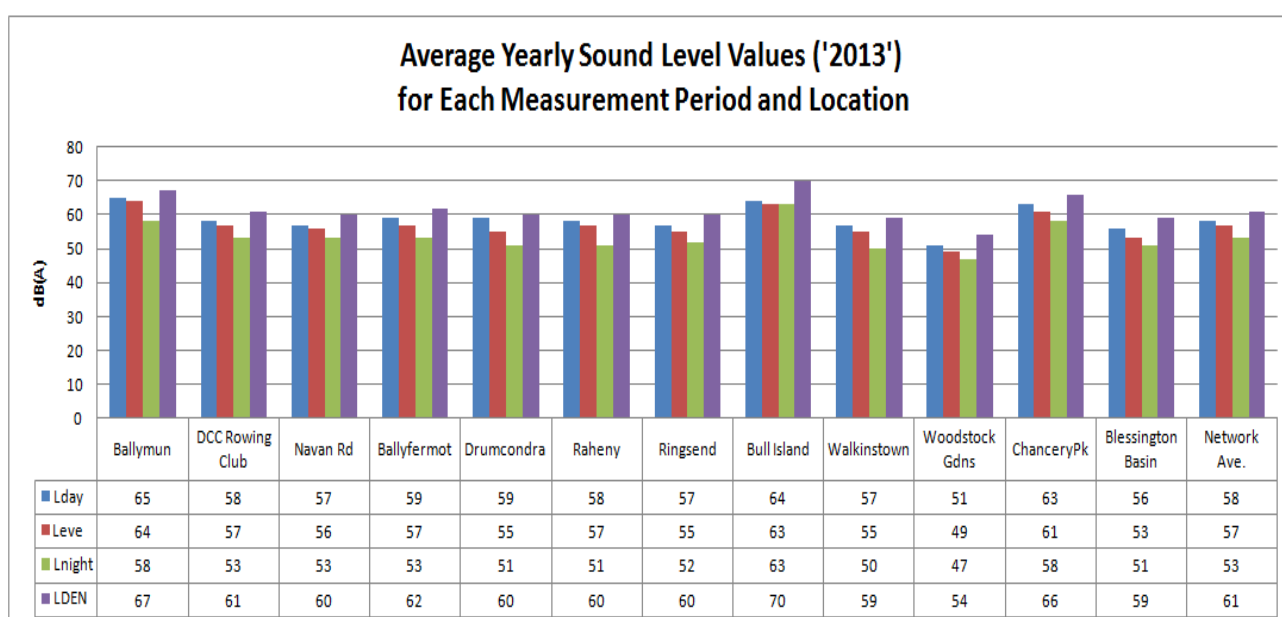


Fig.3



Measurement Results

Throughout this report the use of the term 'noise measurements' has been avoided. Noise is a subjective assessment – i.e. noise being defined as unwanted sound. 'Noise Annoyance', is a term generally used for all negative feelings such as disturbance, dissatisfaction, displeasure, irritation and nuisance (Guski 1999, Quis, 2002). Therefore the monitoring network is not a 'noise monitoring' network. The network measures and monitors actual sound - from all sources. No assessment is made as to whether it is unwanted or not. Only when a comparison is made, for instance in this report, with some valid criteria, can a judgement be made as to whether the sound levels are desirable or not. Bull Island is a case in point. It has produced some of the highest sound levels measured of all the monitoring locations. This is due to high winds and rolling waves. Now, most people would consider the high winds and rolling waves as bracing and refreshing while going for a walk along the beach and would actually enjoy being exposed to such sound. Therefore it would not be considered noise although the night time sound levels are above those which would be considered undesirable. Therefore it has to be borne in mind that the ambient sound monitoring network measures all sound from all sources thus giving an indication of the amount of sound - not noise, the general population is exposed to from the hustle and bustle of daily life.

Over the five years of continuous measurements it is apparent that traffic is the dominant sound sources at most sites. Hourly sound values 'shadow' traffic volumes as they vary throughout the day. This can be seen from the daily variation charts at the back of this report.

As already mentioned, weather also has an important influence on sound measurements. Exceptional wet and windy episodes were experienced in 2013. These periods had a significant influence on the network measurements. Therefore we have included on our website average wind and rain values alongside average daily sound values. These can be viewed through the 'Calendar View' page. Consideration is also being given to co-locating weather stations at some of the monitoring sites in order to try quantify the impact of various types of weather on the sound measurements.

Comparison of the Network Lden values with last year shows no significant change in 2013 values over 2012. On an individual site by site comparison, it is difficult to make any valid comparisons with 2012 due to the atypical weather experienced in 2013.

Sound Levels Variations

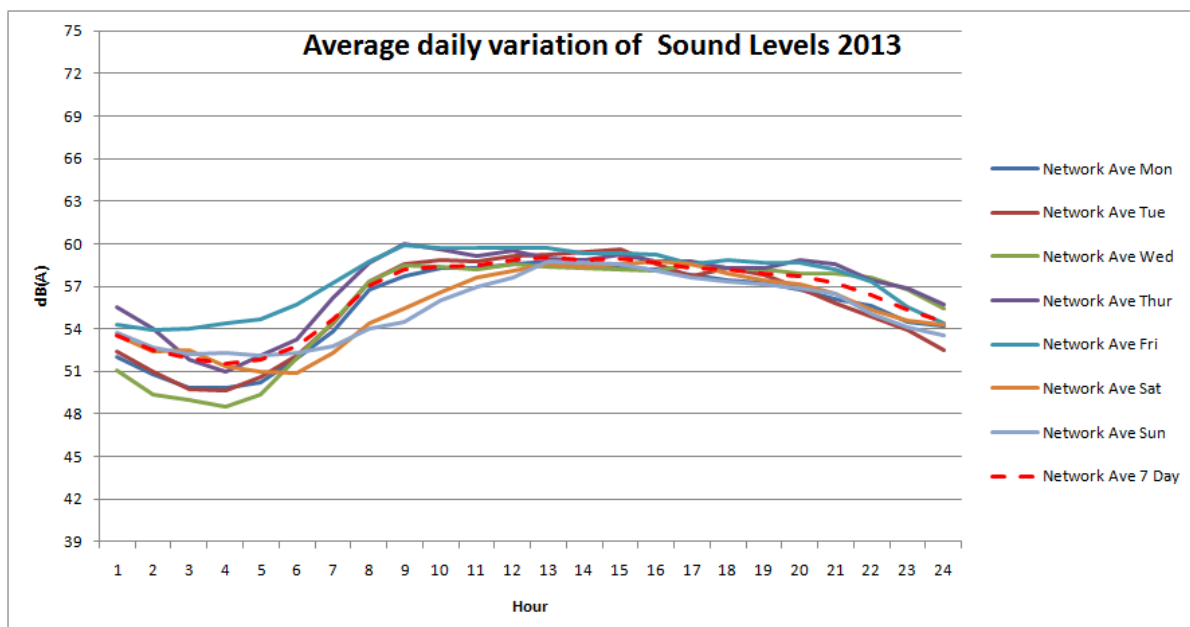
The site summaries 'Average LAeq' (sound levels) provide a more detailed view of how sound levels vary from hour to hour throughout the average day and between the different days of the week. During the average weekday sound levels (along with traffic levels) start rising at 6 a.m. After approximately 9 a.m. sound levels at most sites level off until 9pm when they start to fall. It is interesting to note as with previous years, early Saturday and Sunday morning sound levels are

higher than the same periods during the week. The peak sound levels on weekend mornings arise between ten and eleven a.m. It is thought these differences are due to different social activities at these times with less traffic on the road on late Saturday and Sunday mornings and more traffic coming from late night social events early Saturday and Sunday mornings.

The average individual site measurements for early morning on Friday were above the levels to be expected and were well above levels observed over the past four years. This was due to the influence of abnormal high winds and rain for periods throughout the year but which included a number of Fridays. The sites with the lowest daytime sound values were Woodstock Gardens, and Blessington Basin with Navan Road, Raheny and Ringsend tying for third. The three sites with the highest daytime sound values were Ballymun, Bull Island and Chancery Park. The sites with the lowest night time sound values were Woodstock Gardens and Walkinstown with Blessington Basin, Raheny and Drumcondra tying for 3rd. The sites with the highest night time sound values were, Bull Island, Ballymun and Chancery Park.

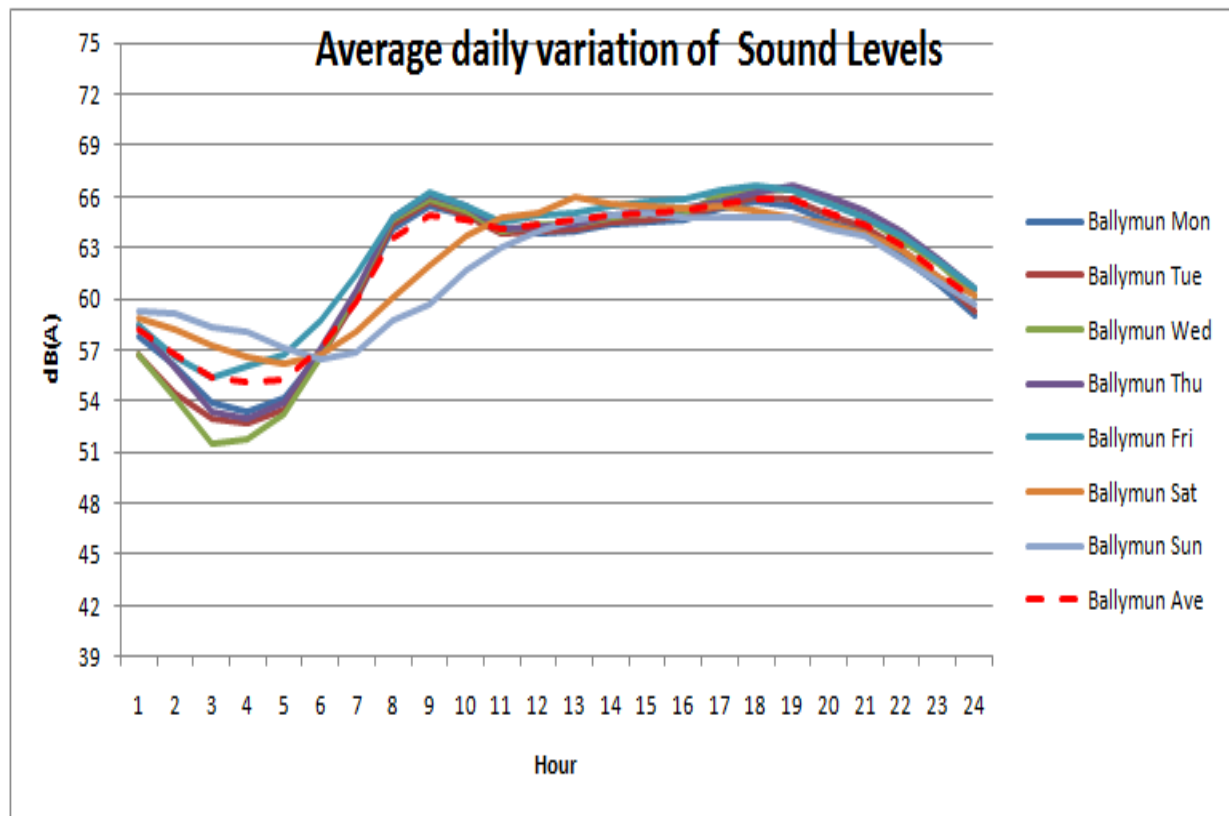
The Monthly Charts to the rear of this report present a detailed view of how average daily sound levels change from day to day and month to month. In 2013, the Network's highest average monthly sound levels occurred in December, followed by October and April. The Network's average monthly lowest levels were experienced in July followed by August and February.

Fig.4

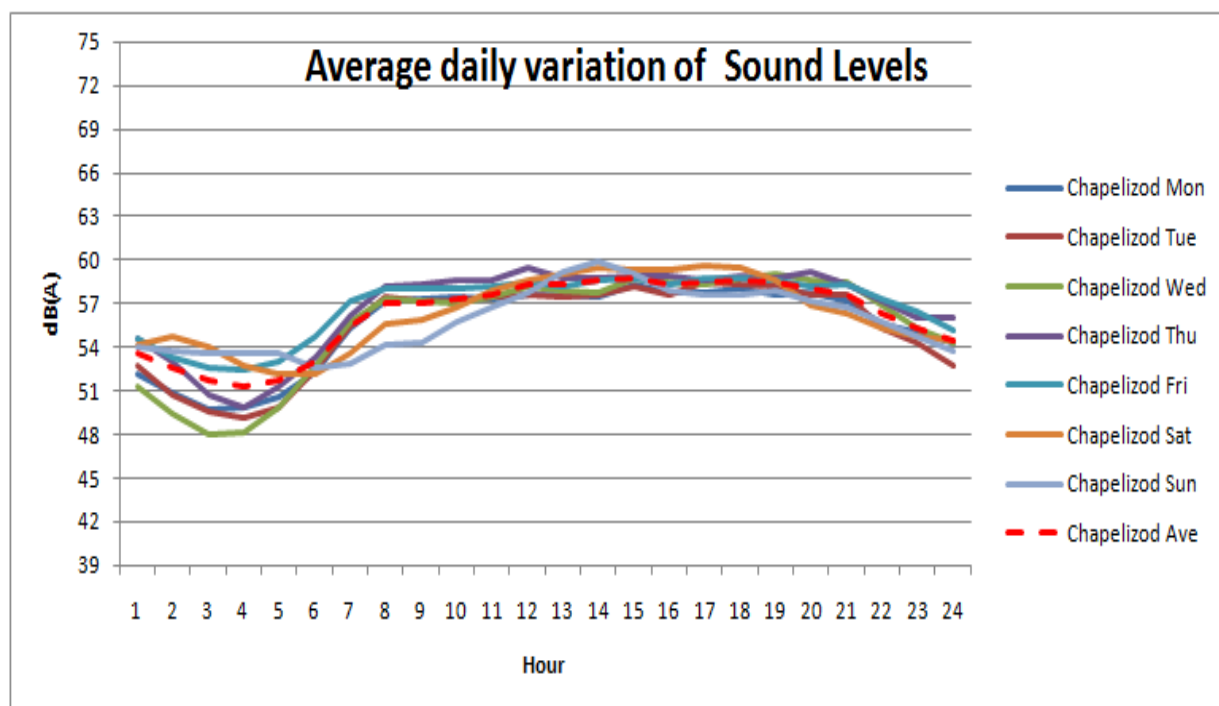


Average Daily Summary Charts

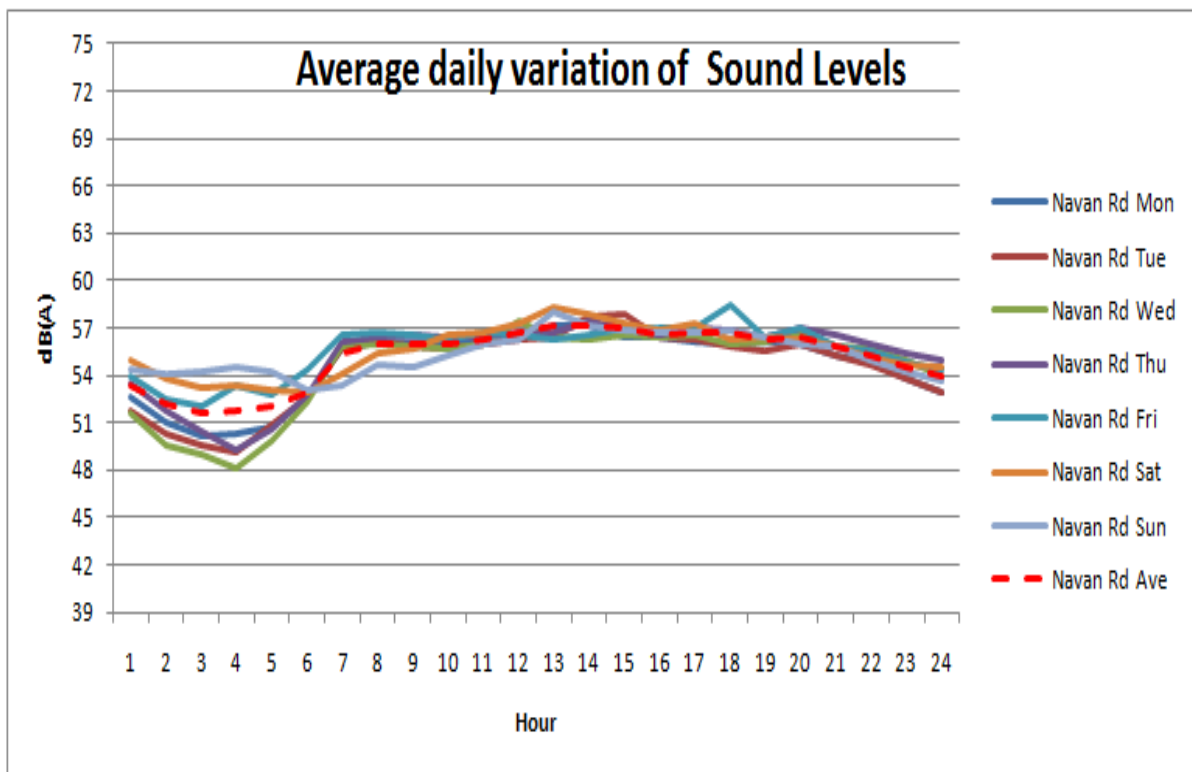
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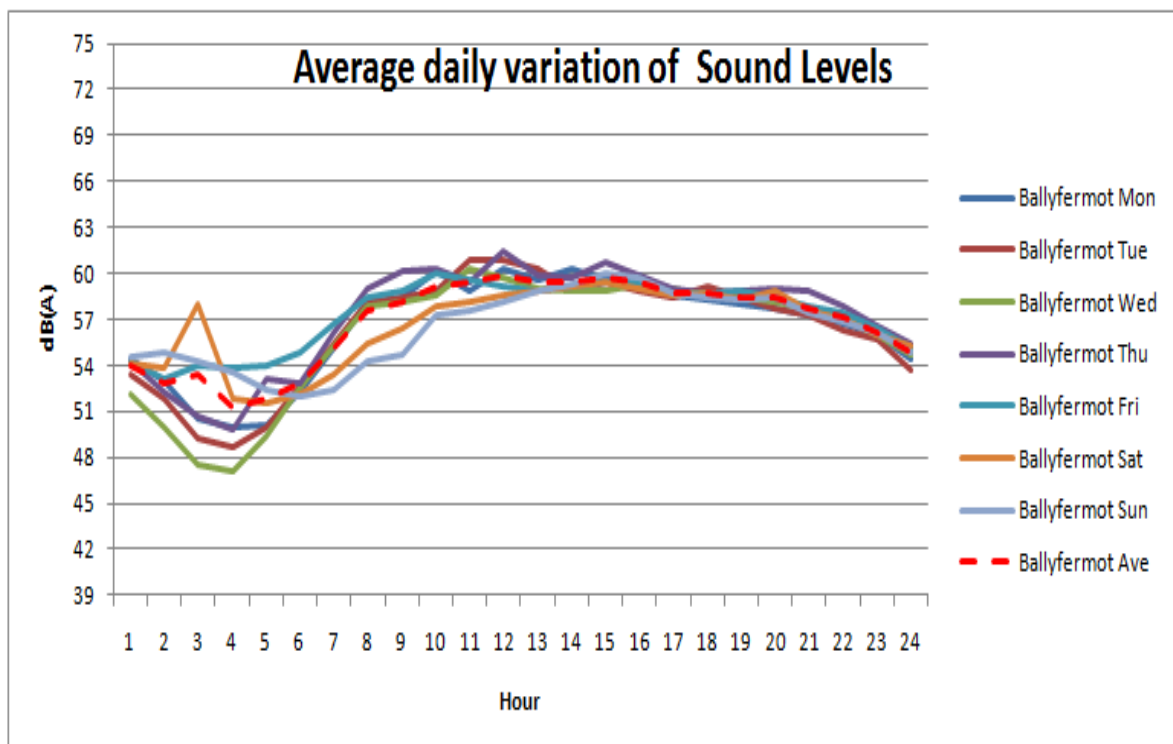
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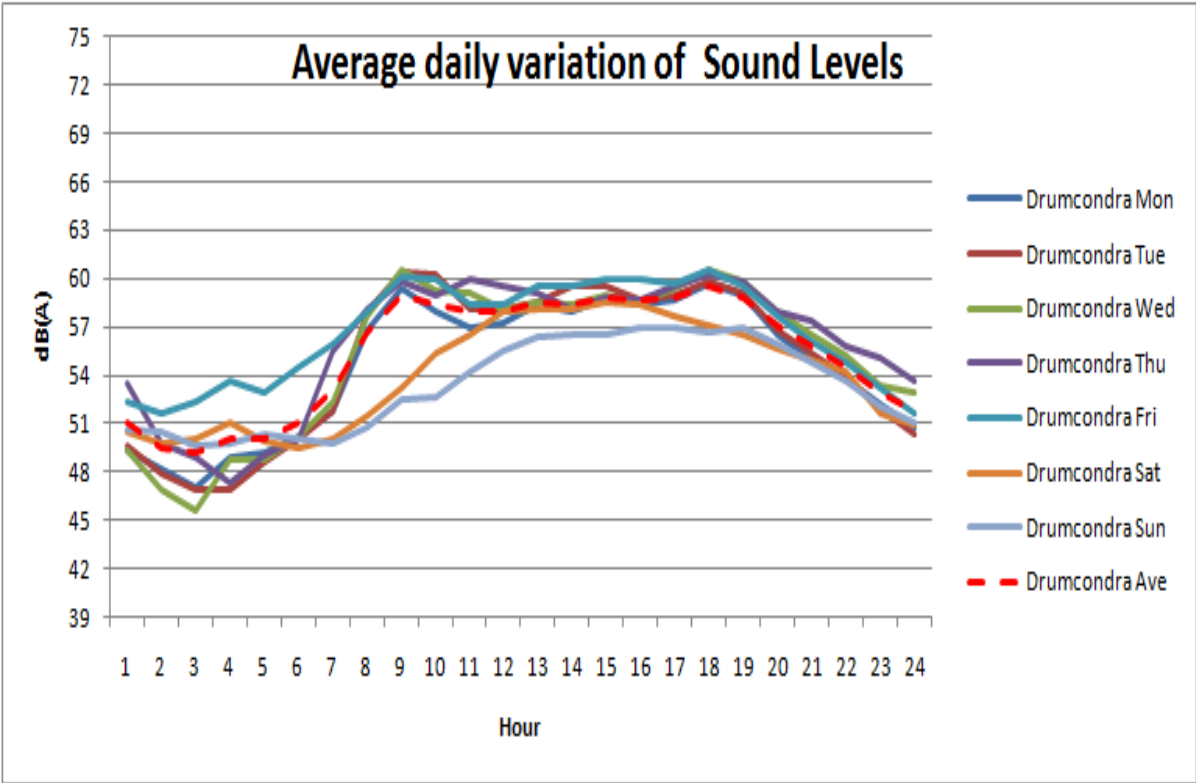
NAVAN RD.



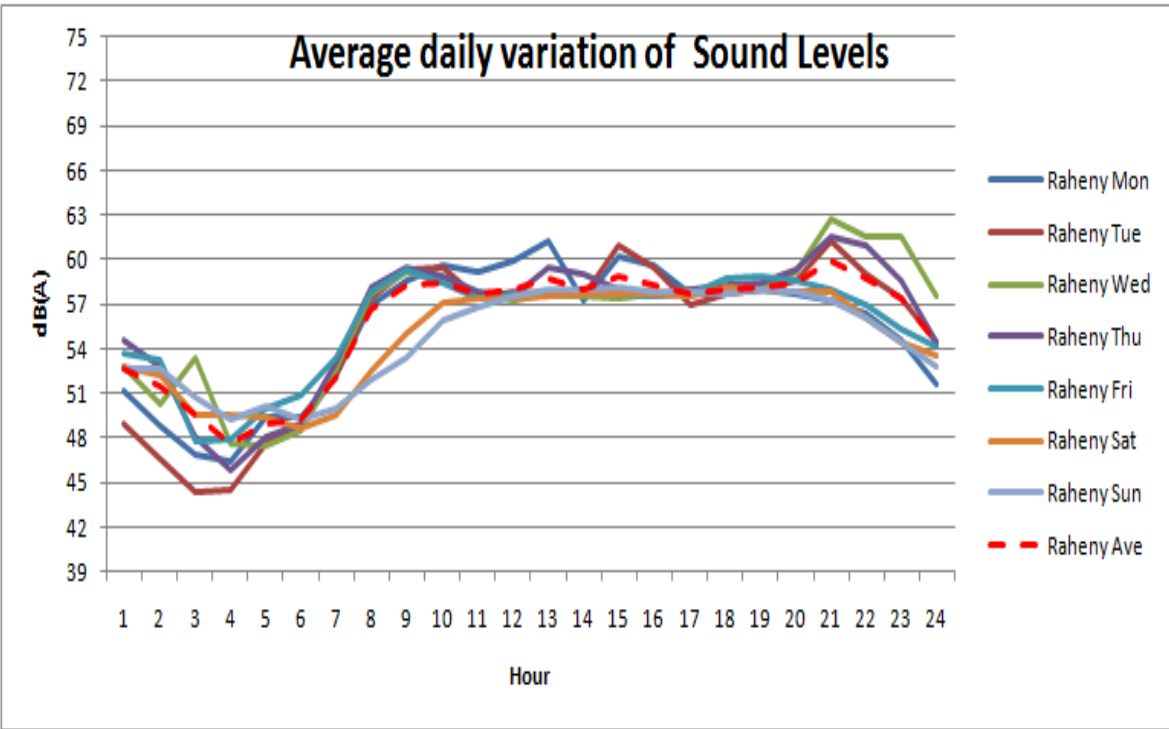
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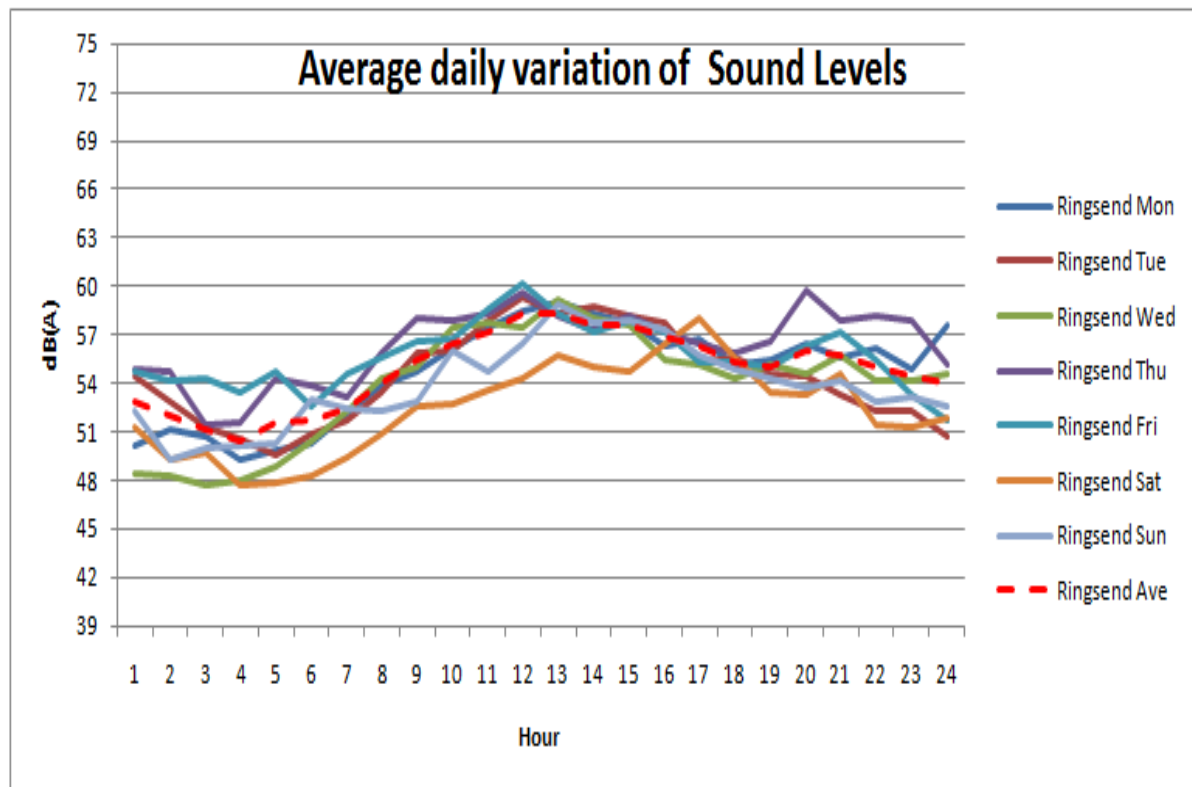
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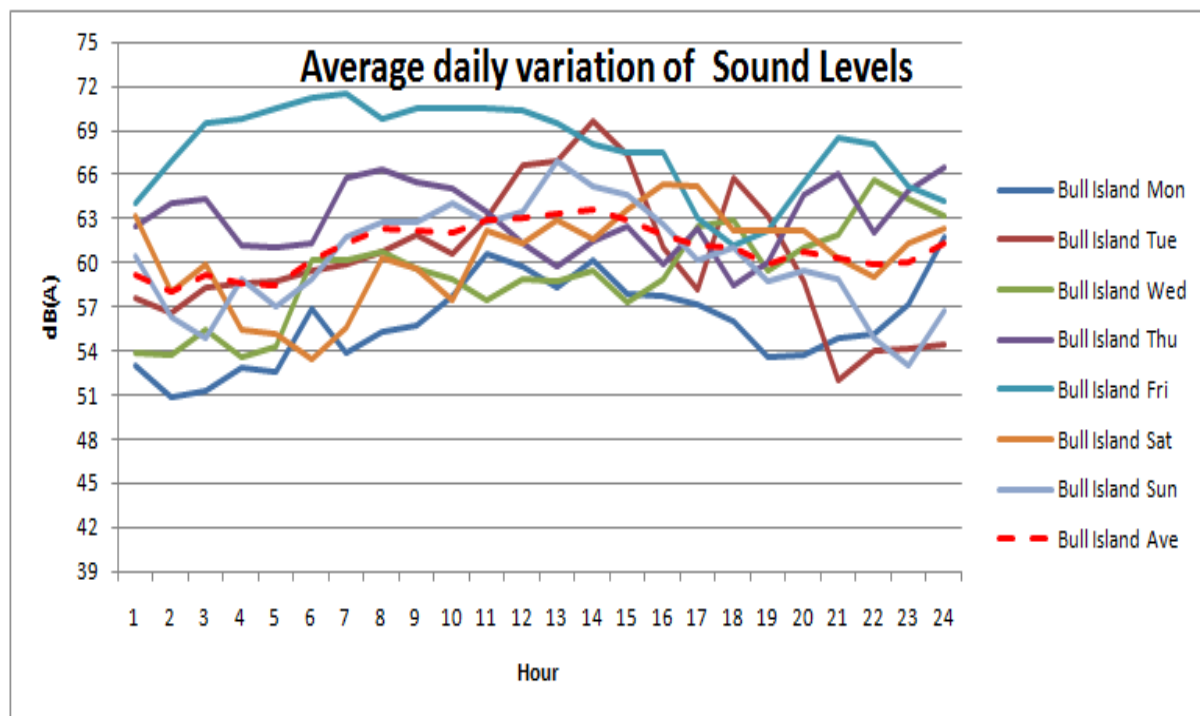
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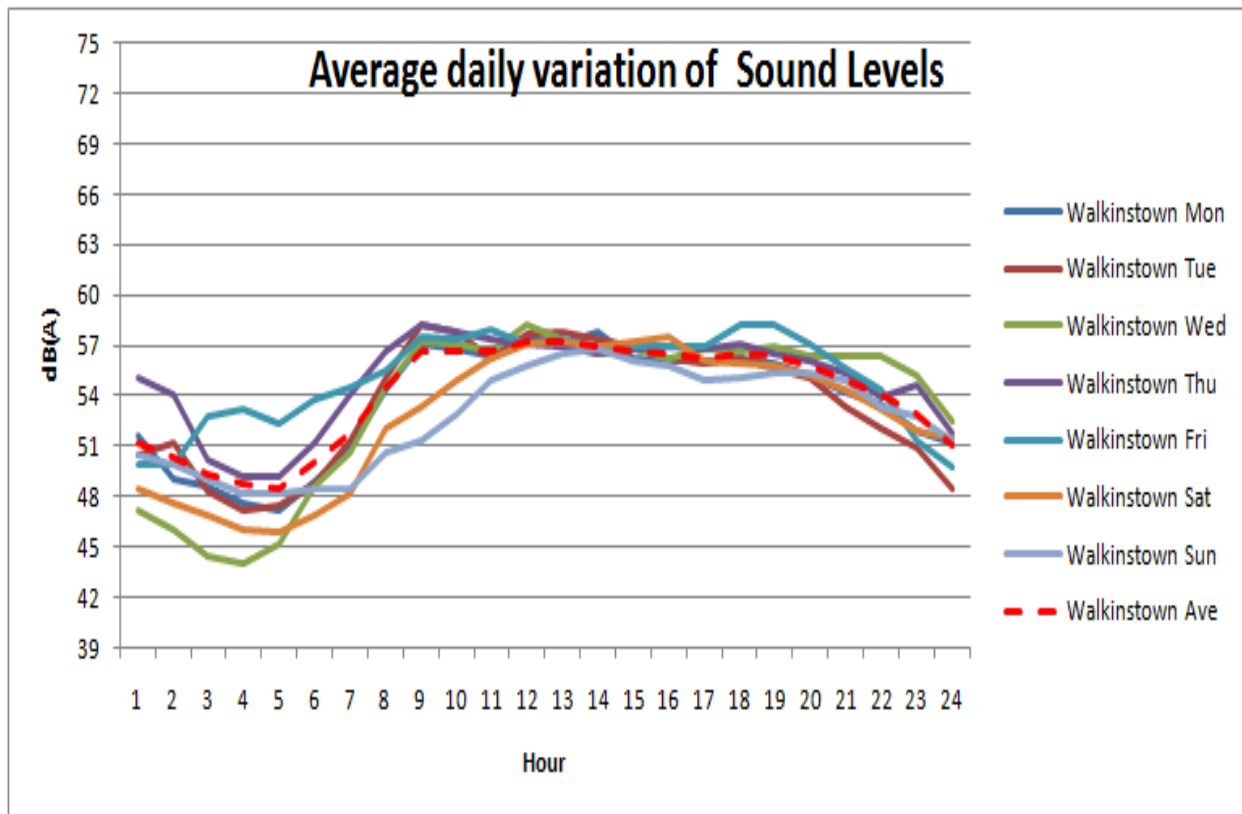
RINGSEND



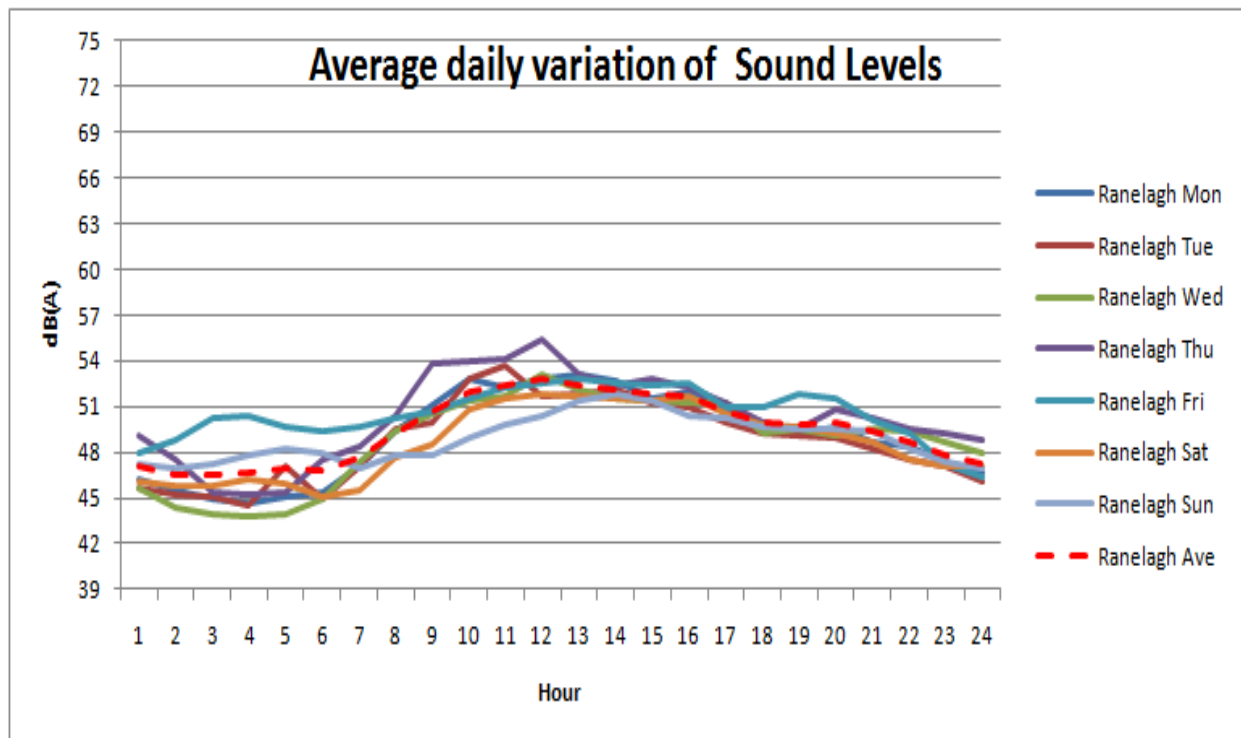
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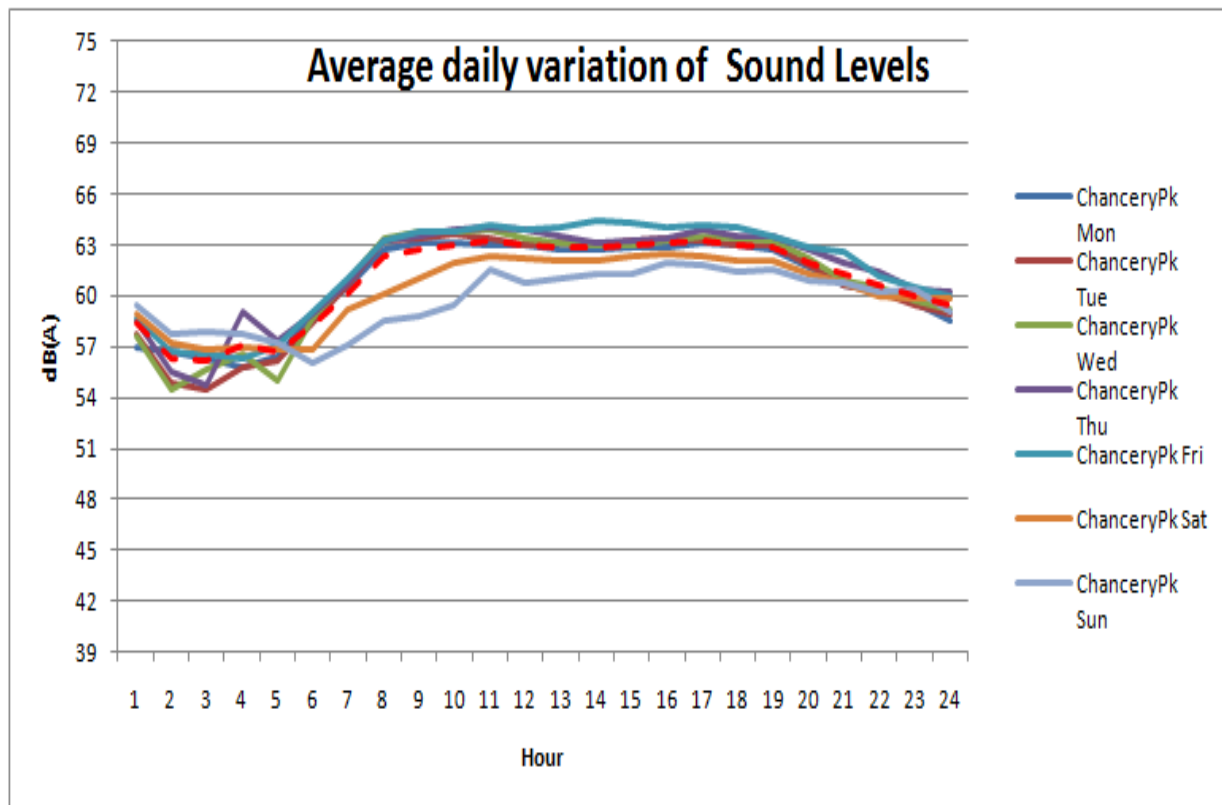
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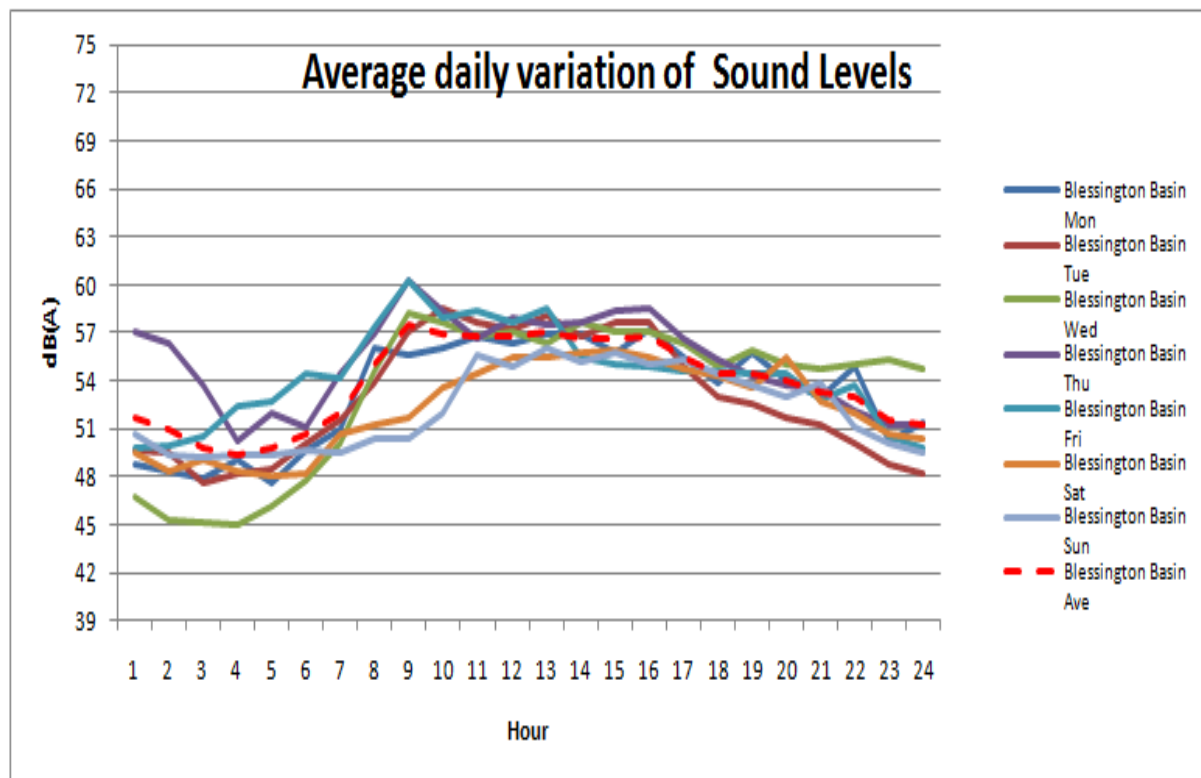
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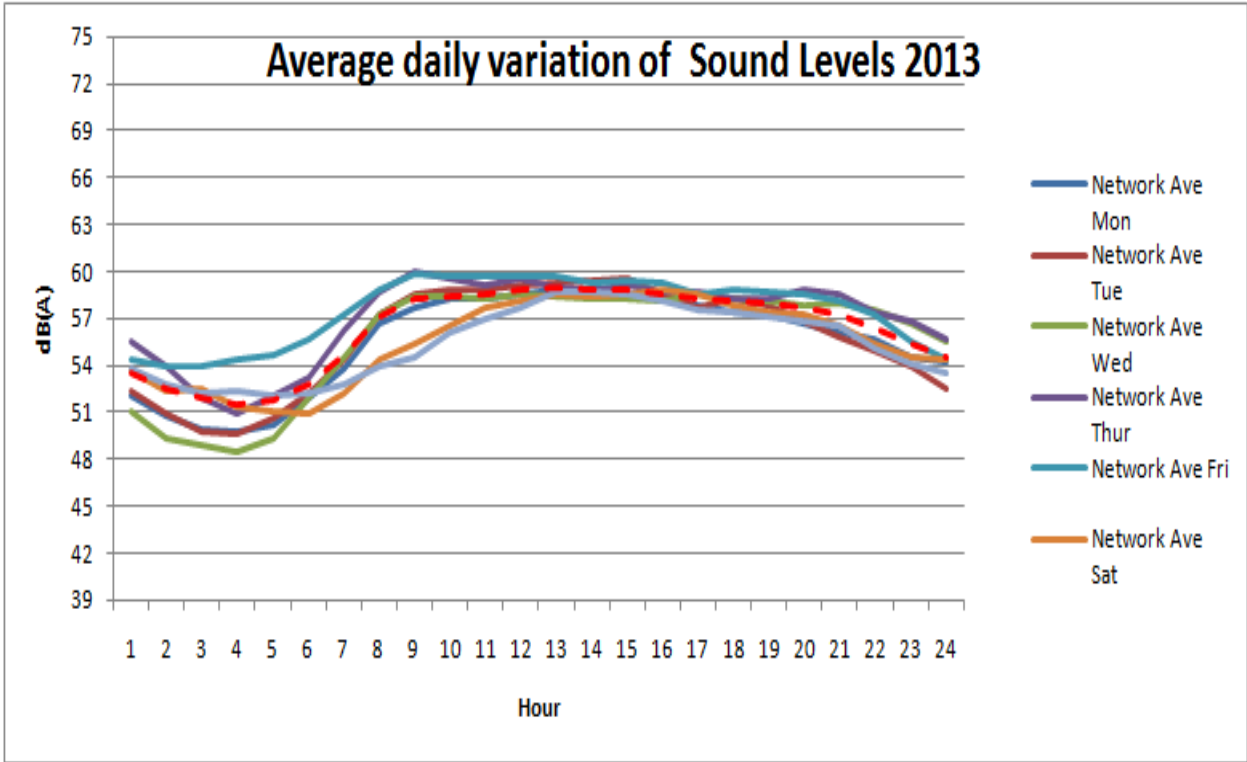
CHANCERY PARK



Blessington Basin

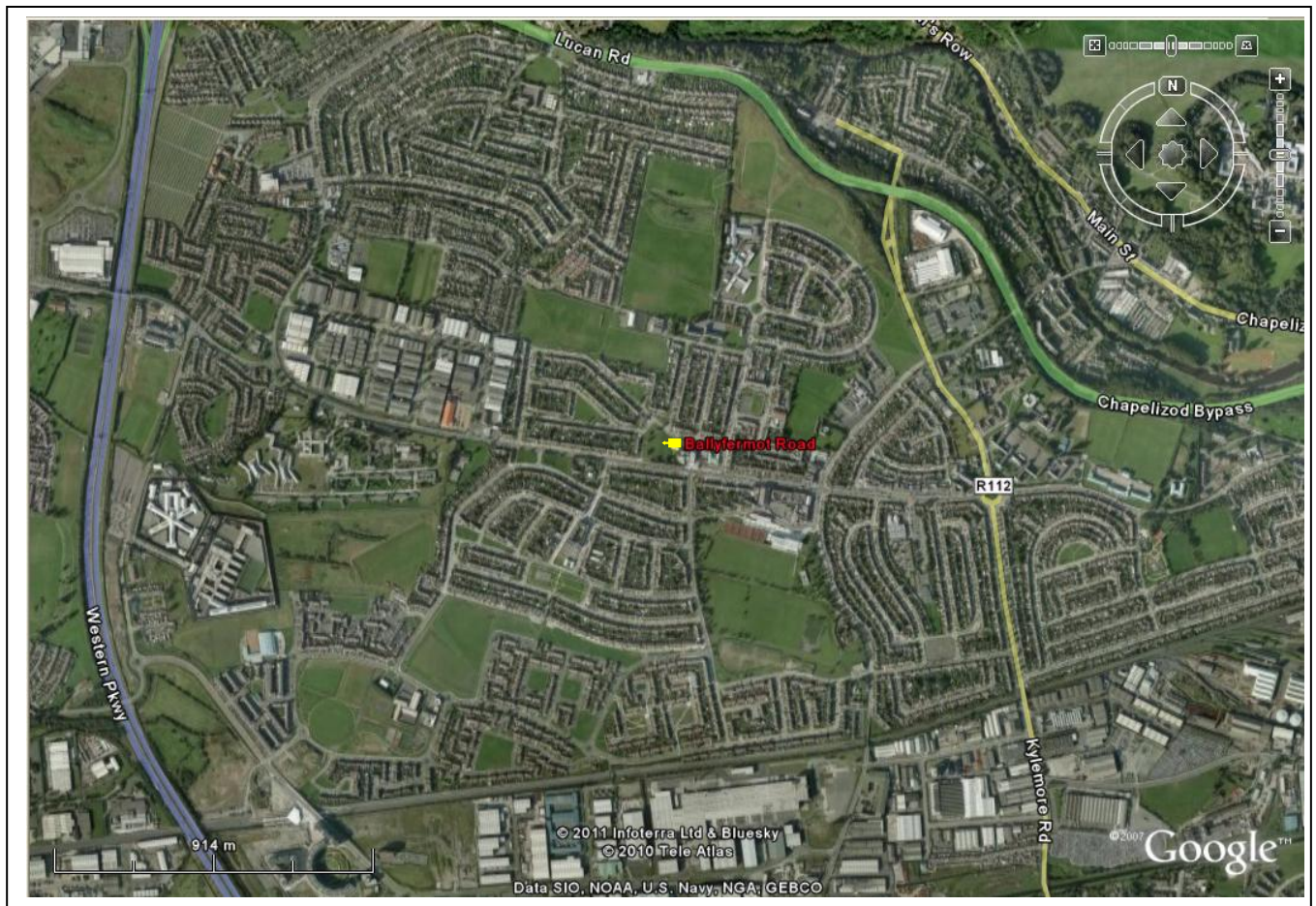


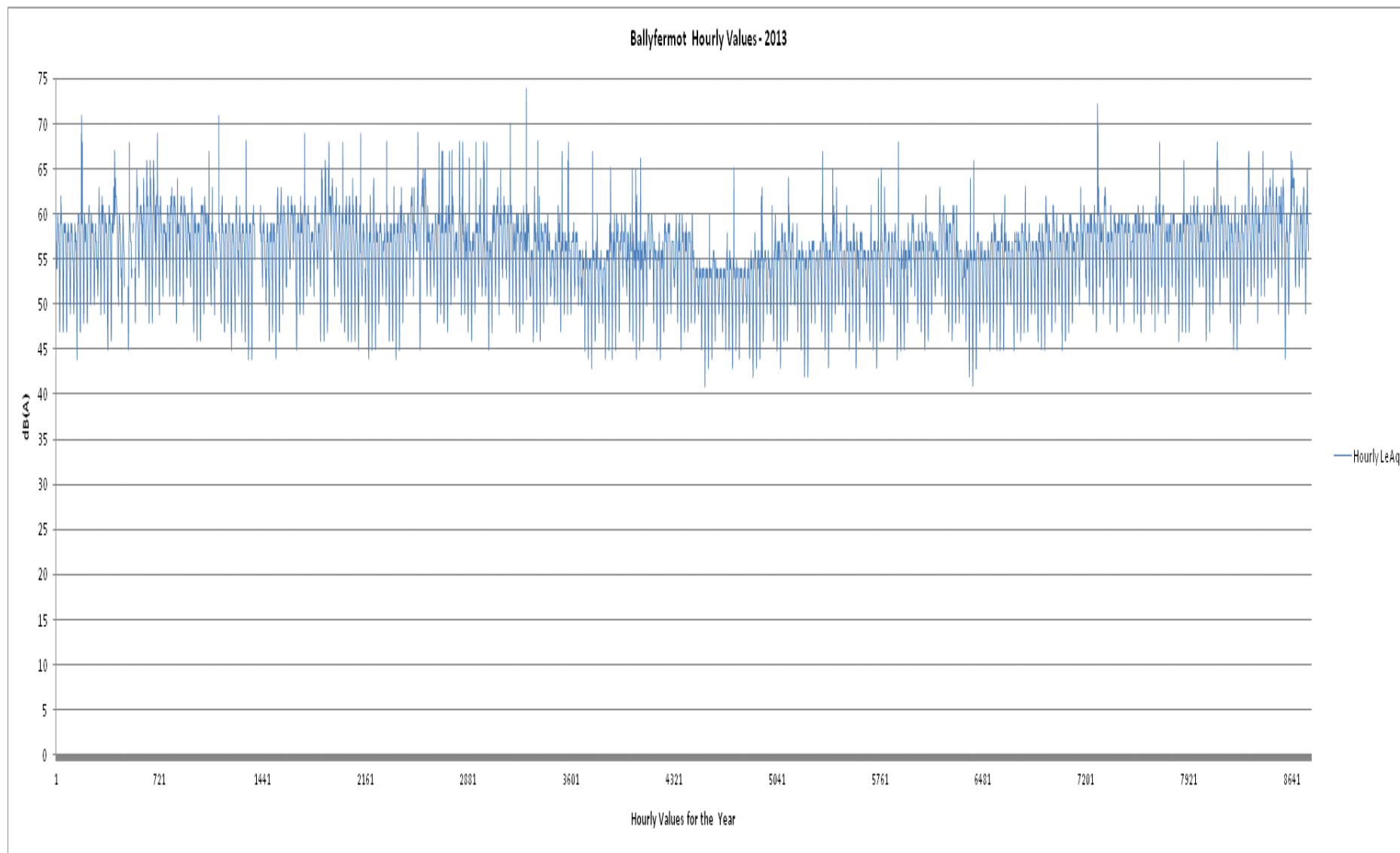
NETWORK

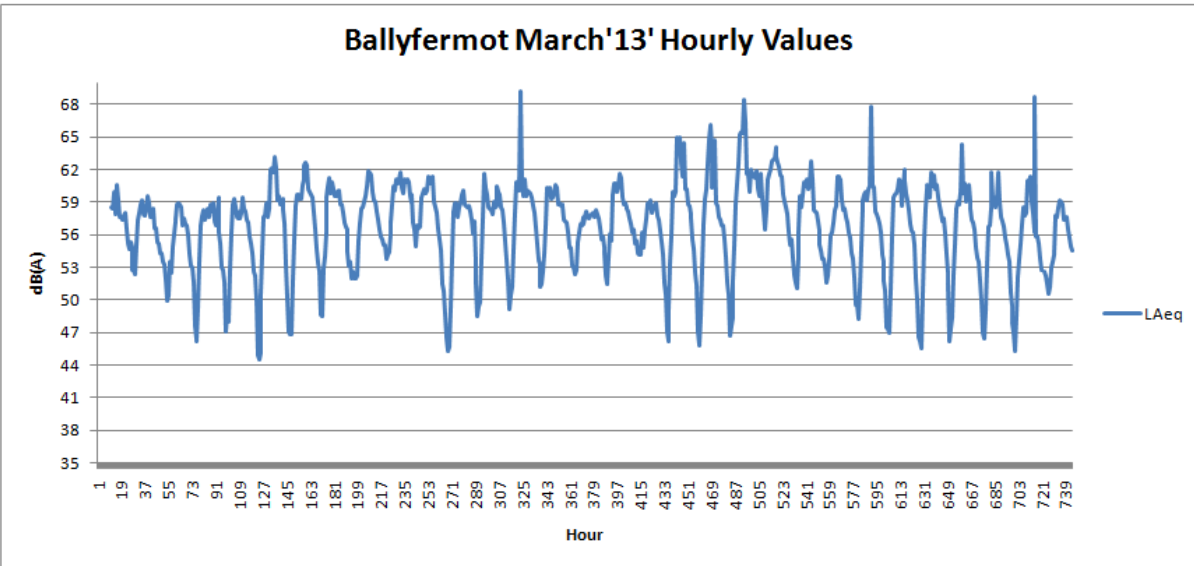
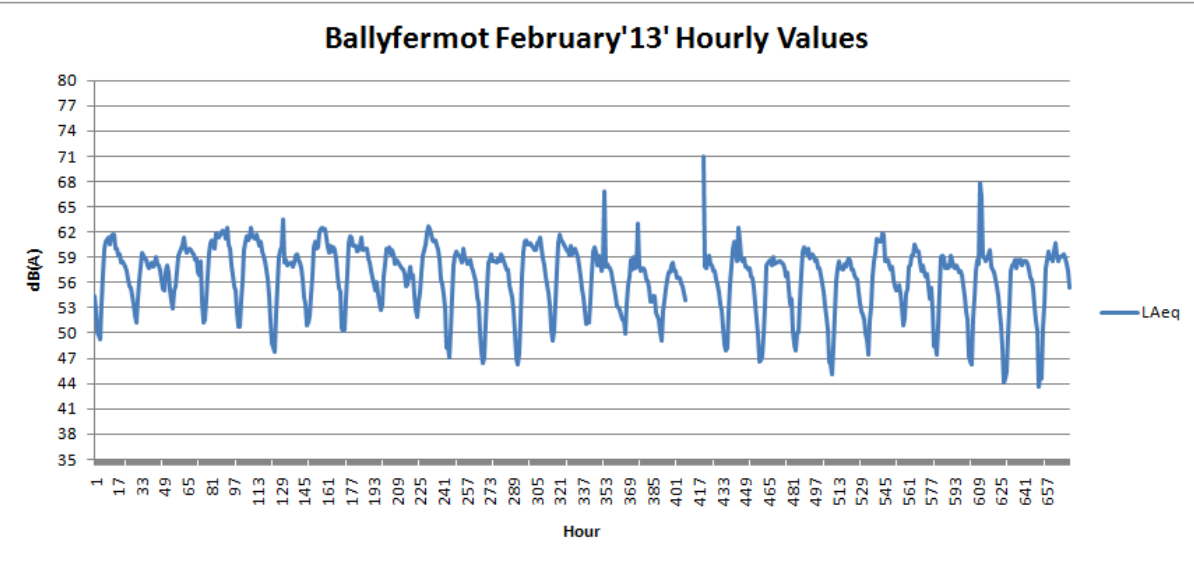
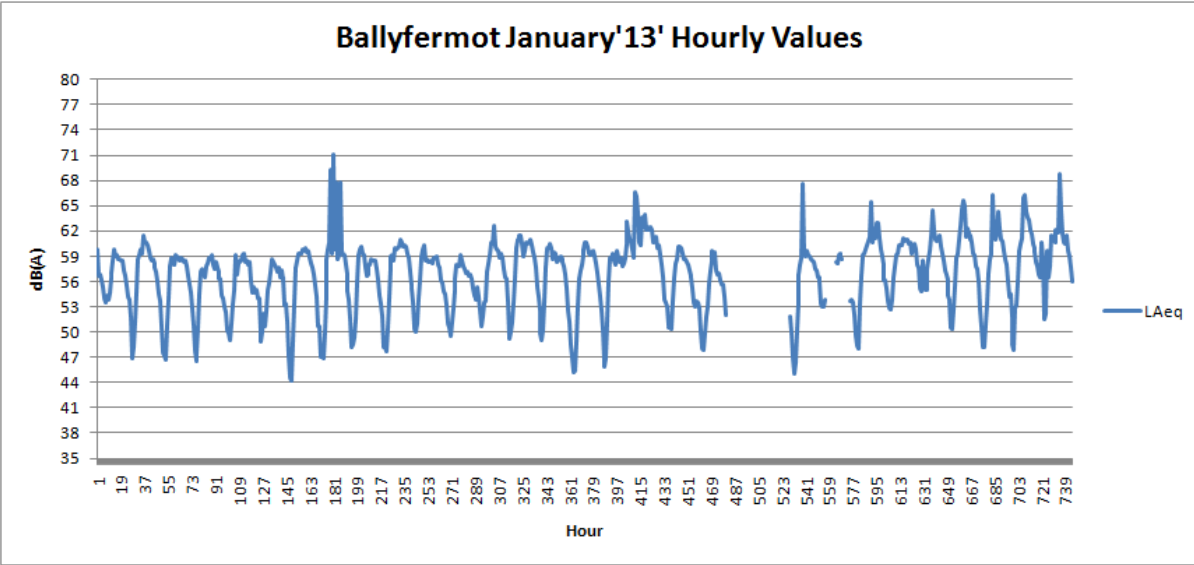


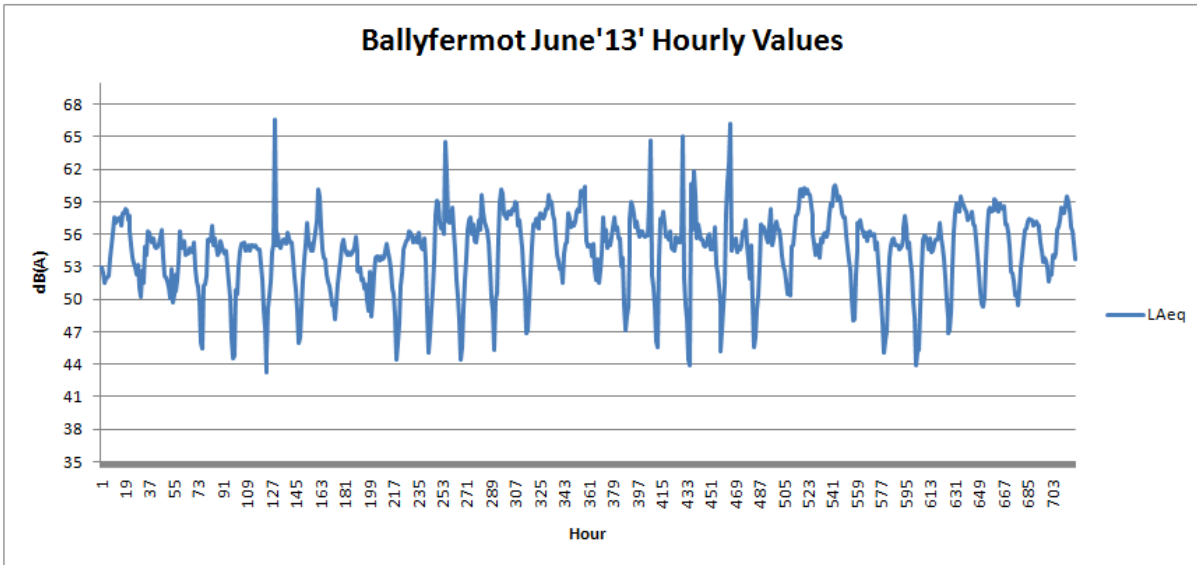
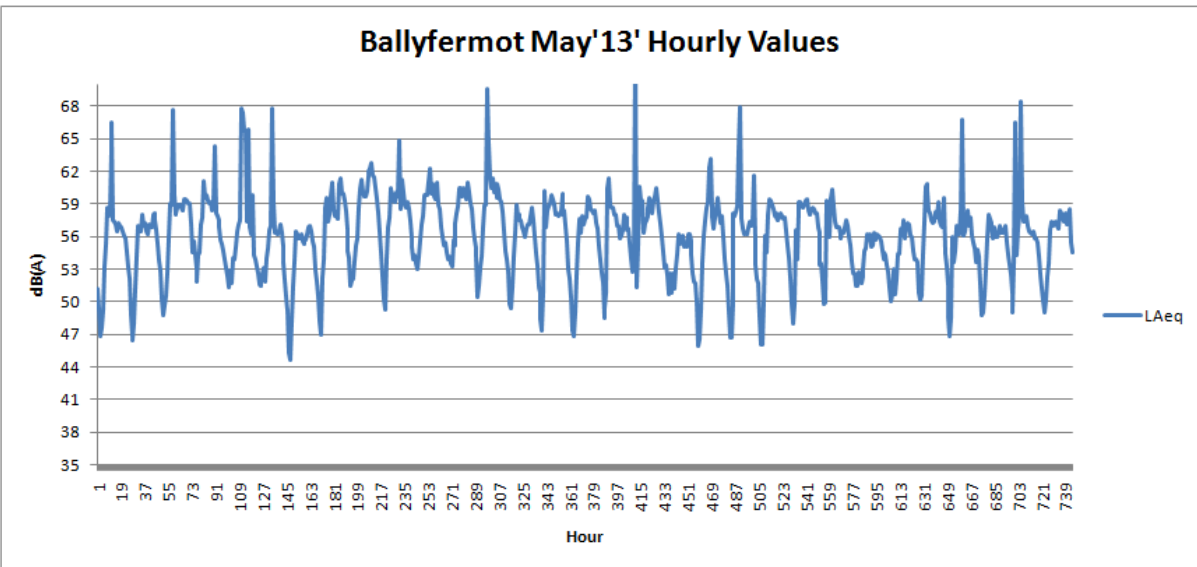
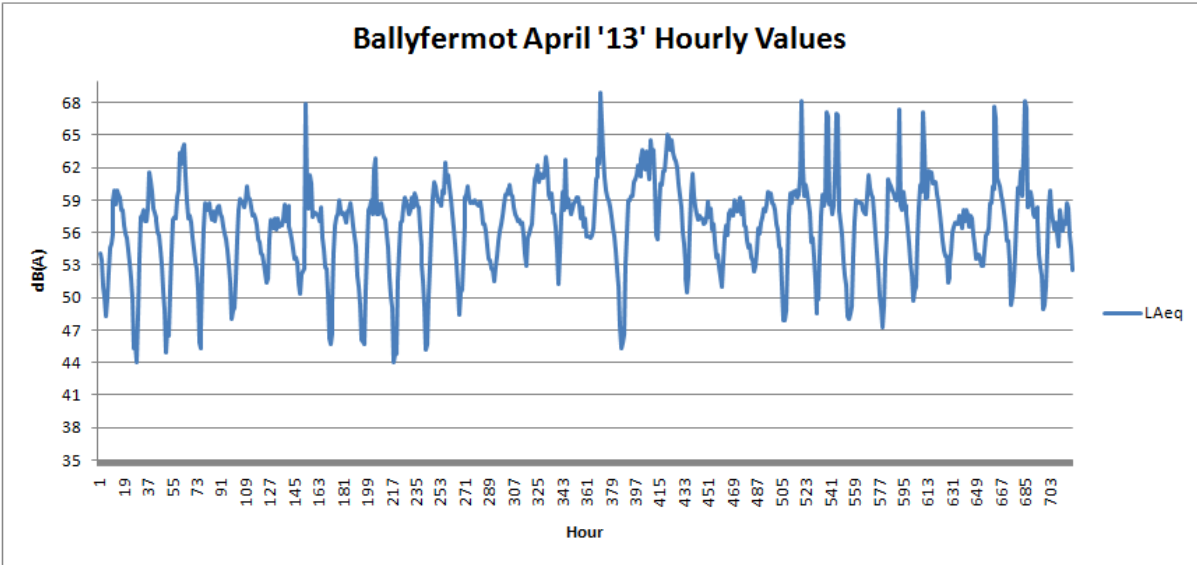
Monthly Summary Charts

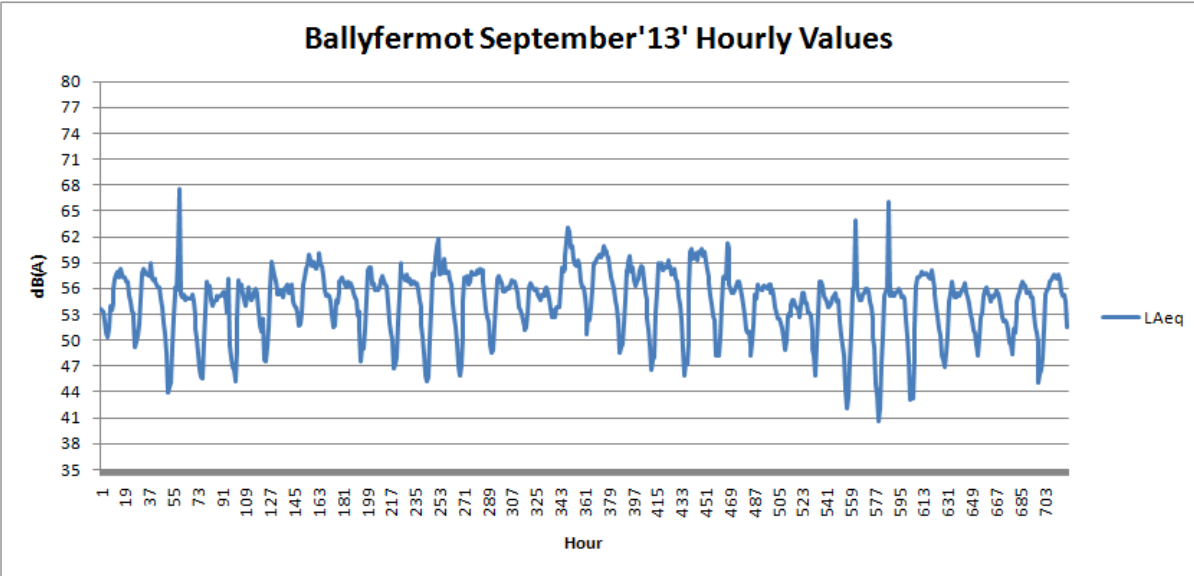
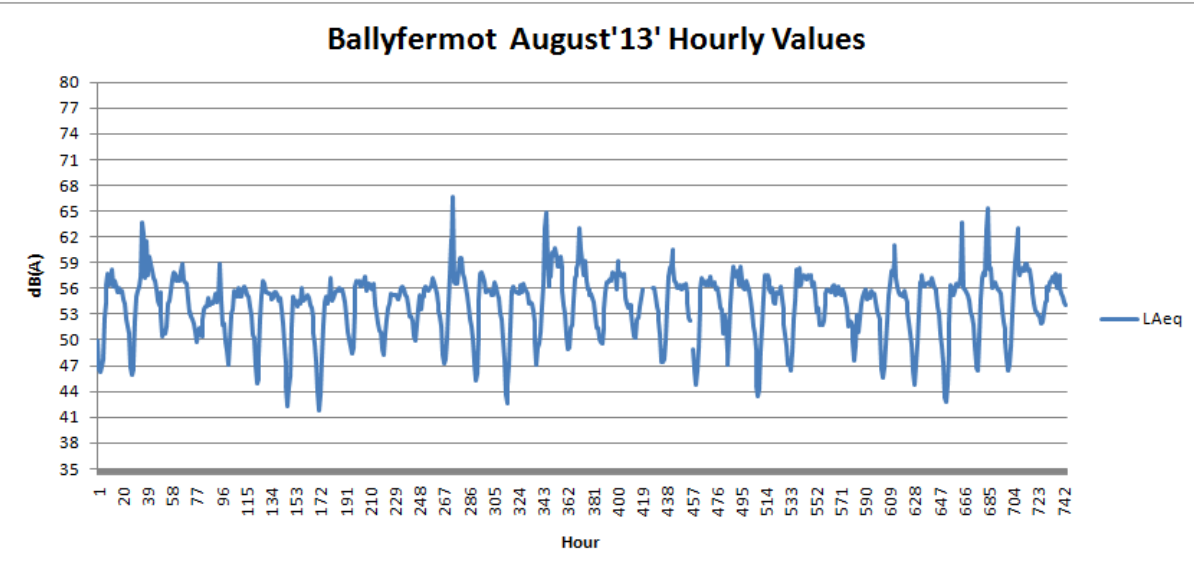
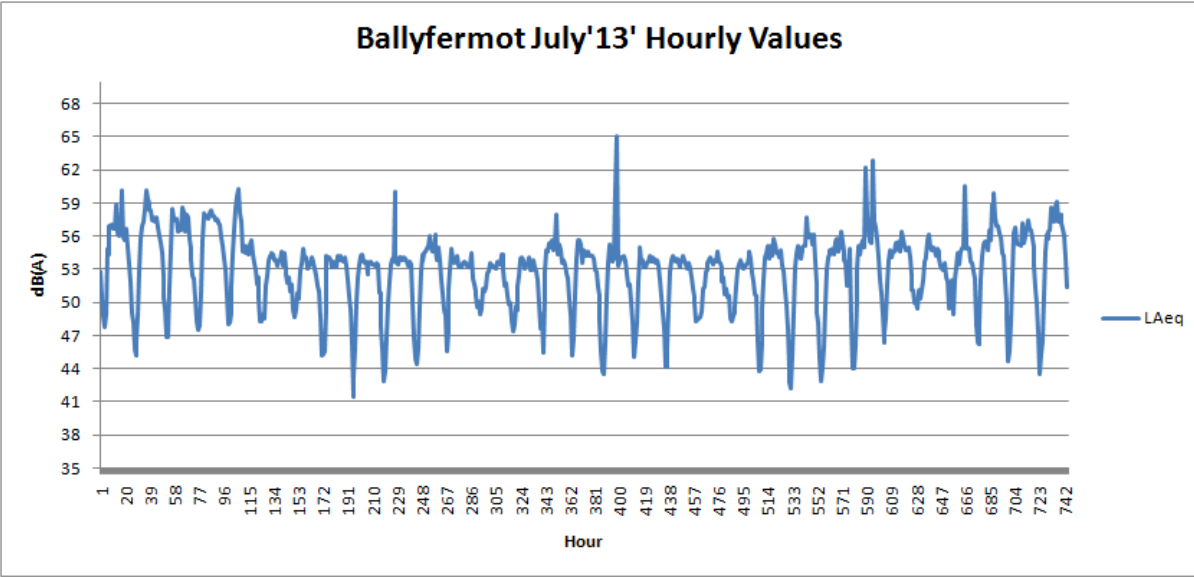
BALLYFERMOT CIVIC CENTRE
BALLYFERMOT ROAD
DUBLIN 10

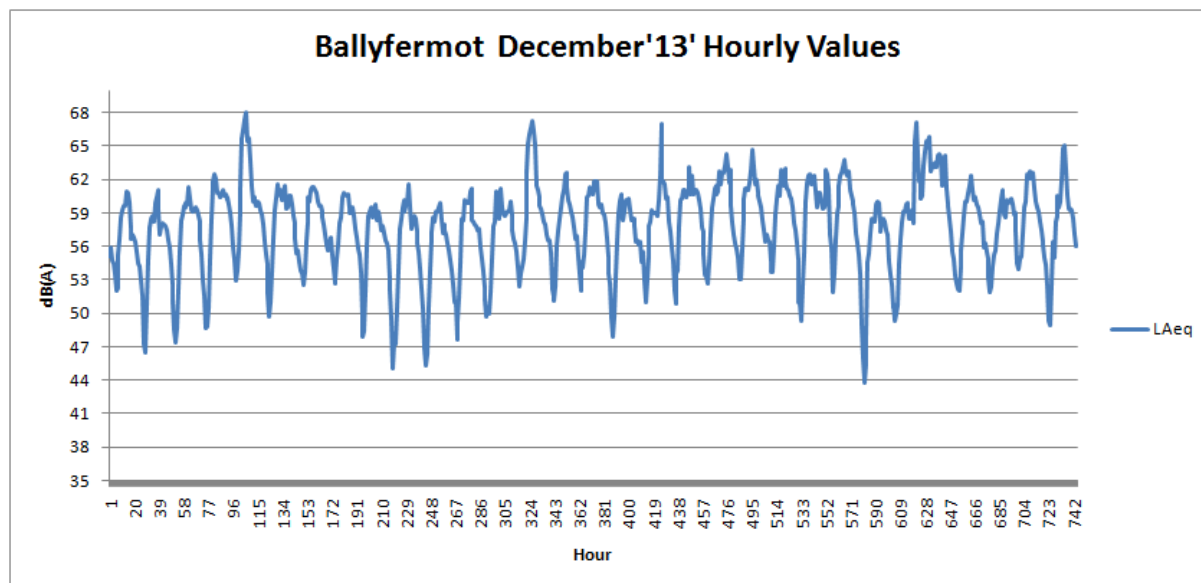
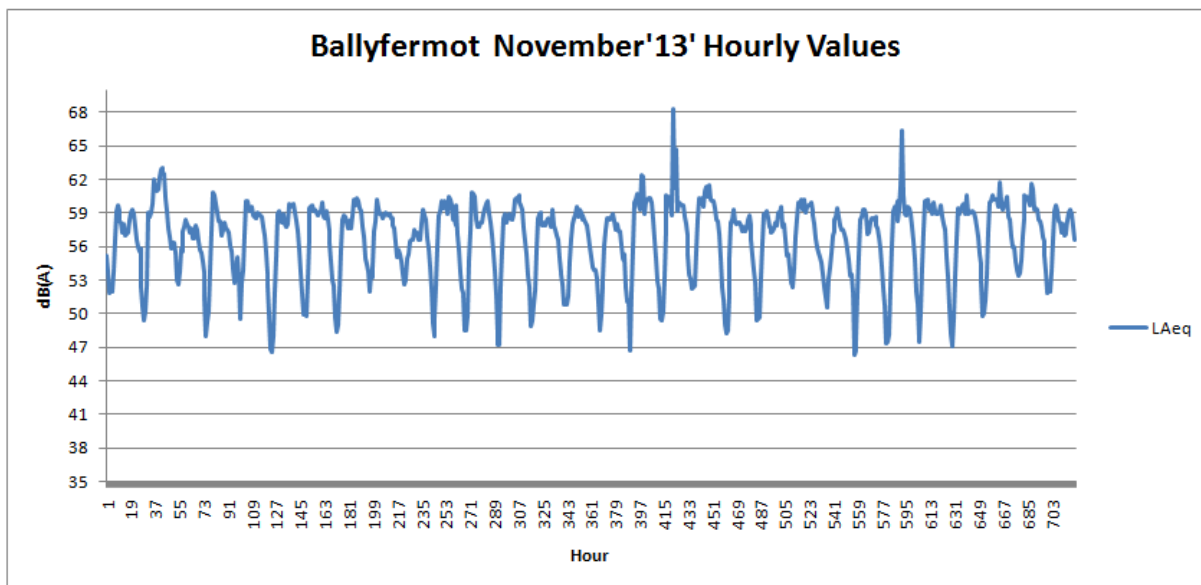
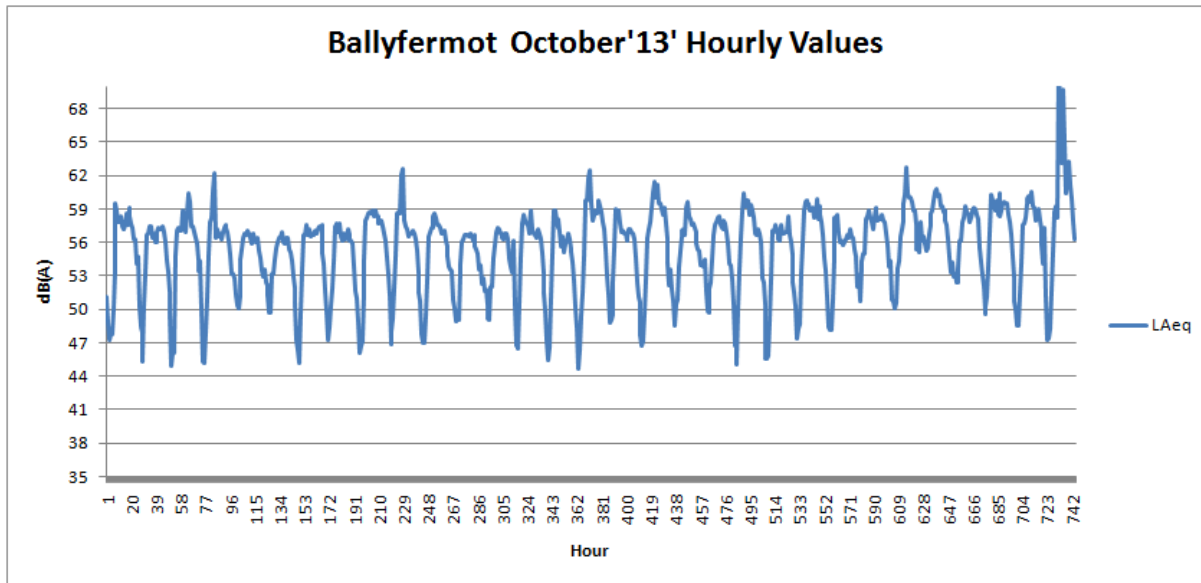






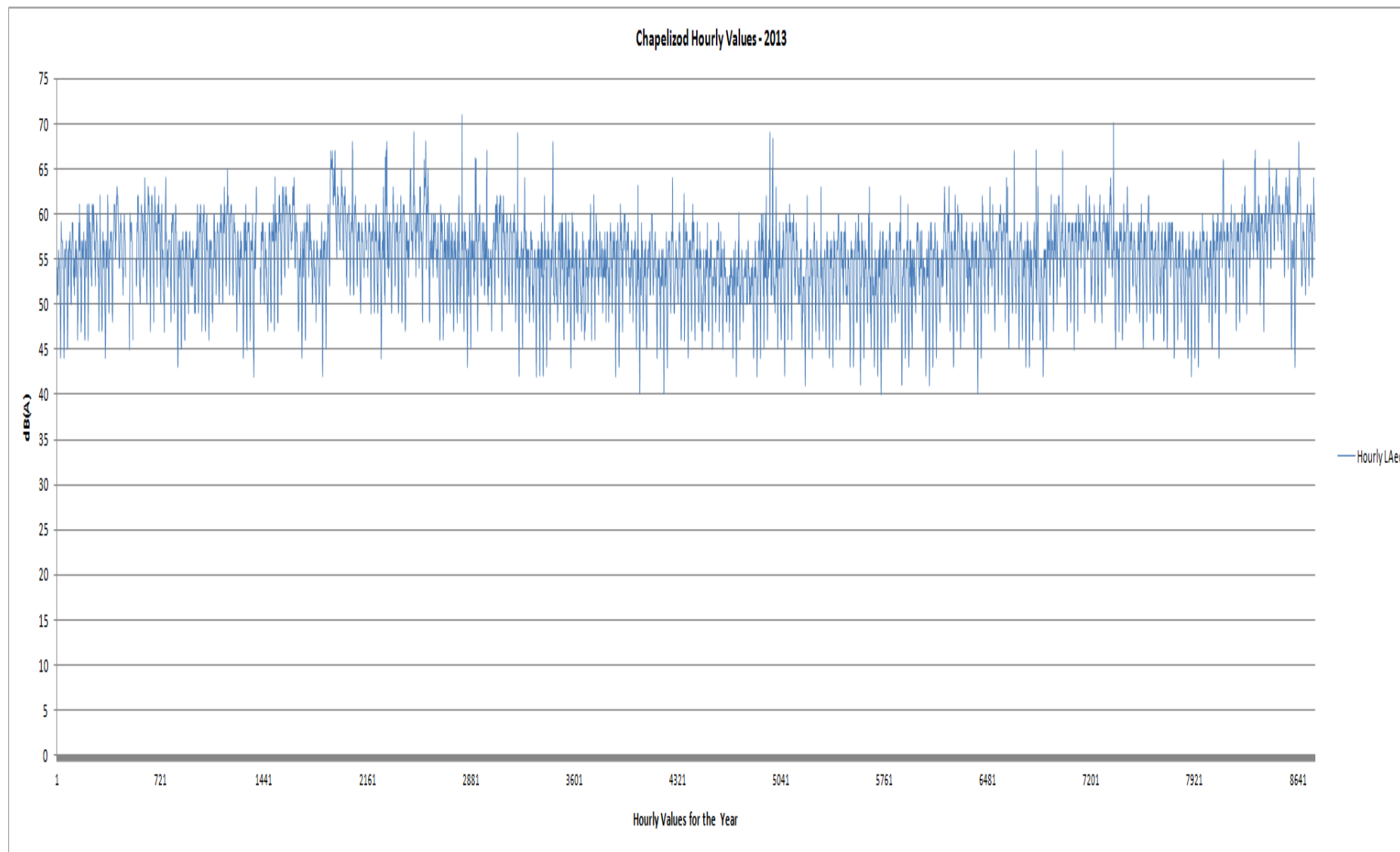


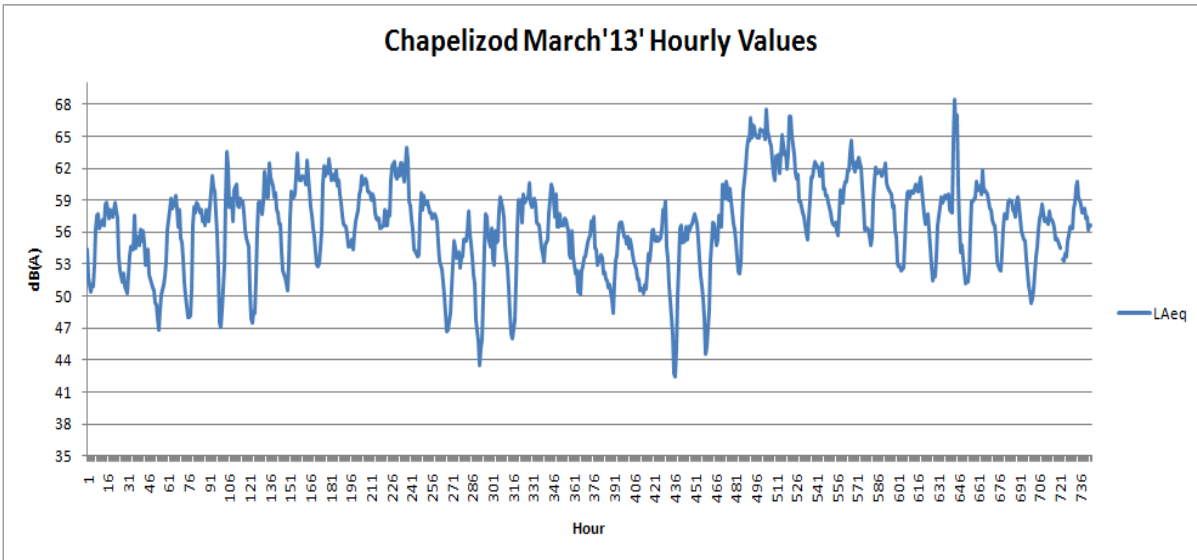
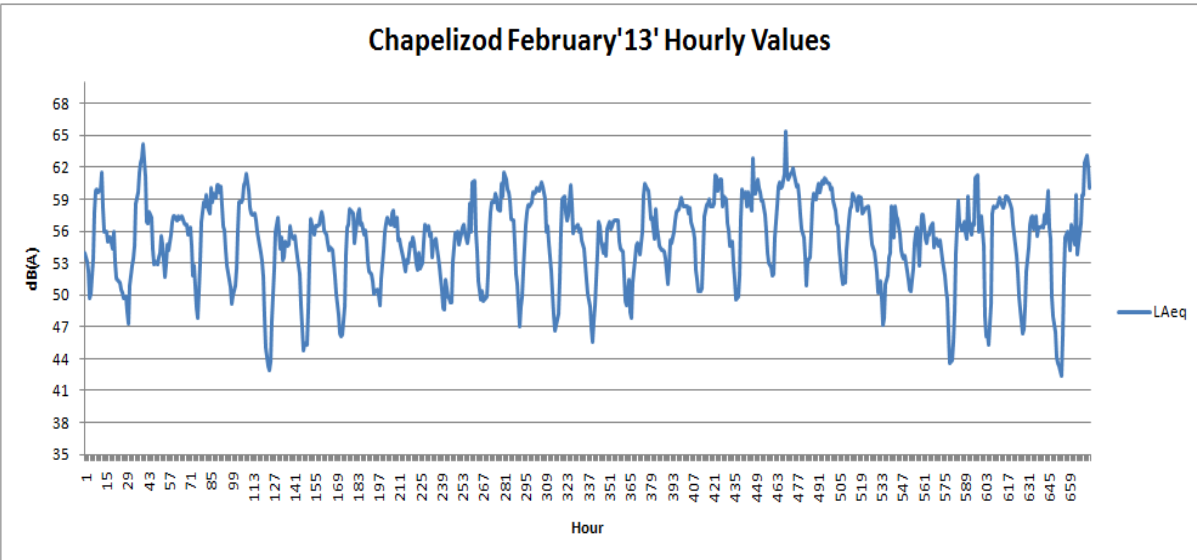
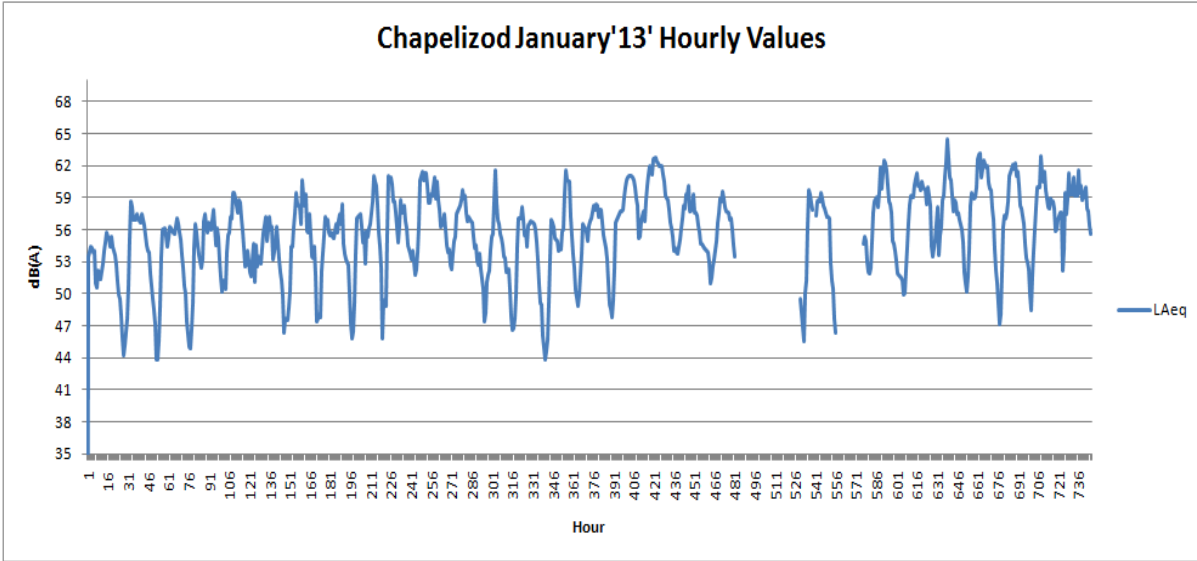


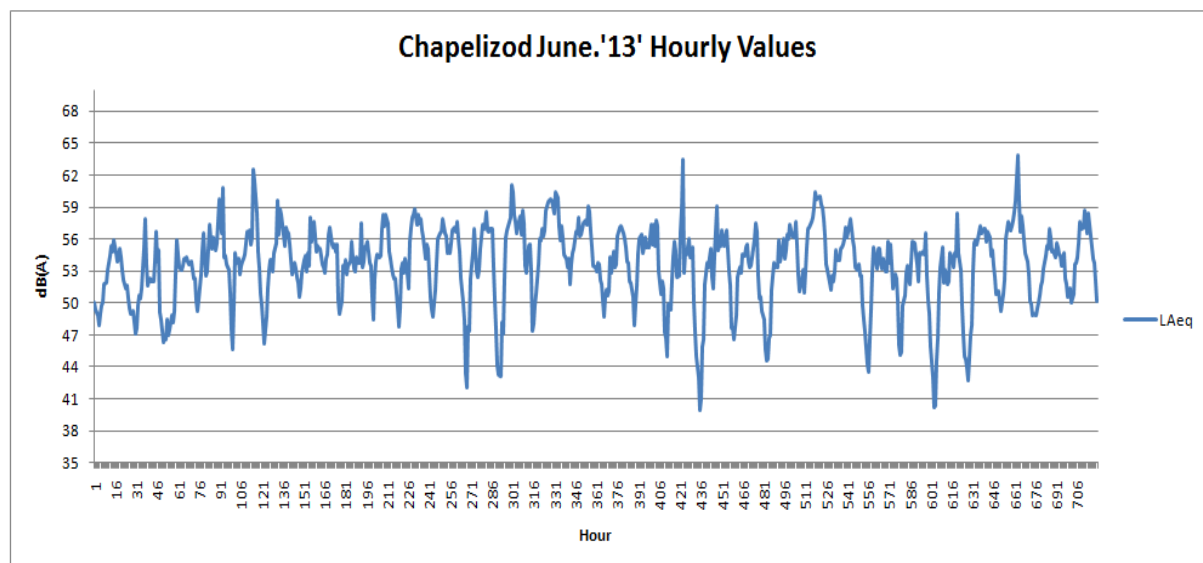
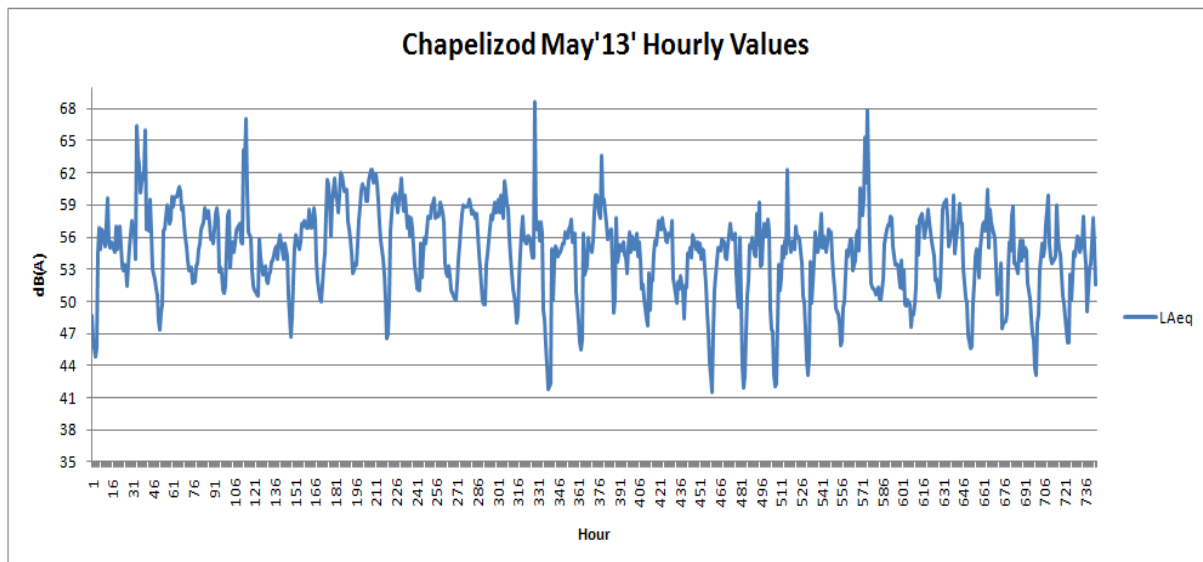
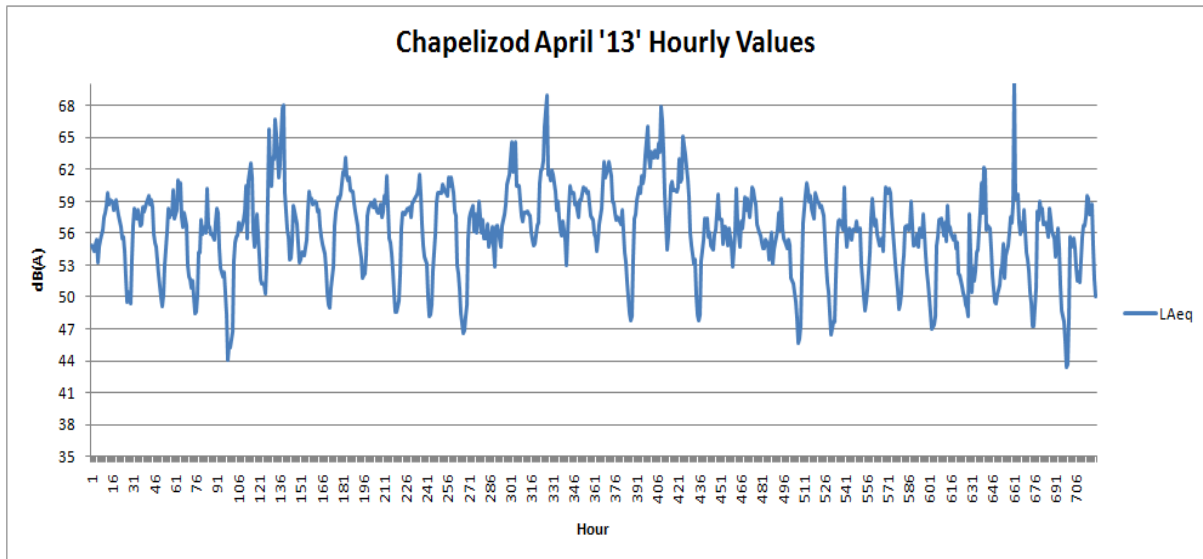


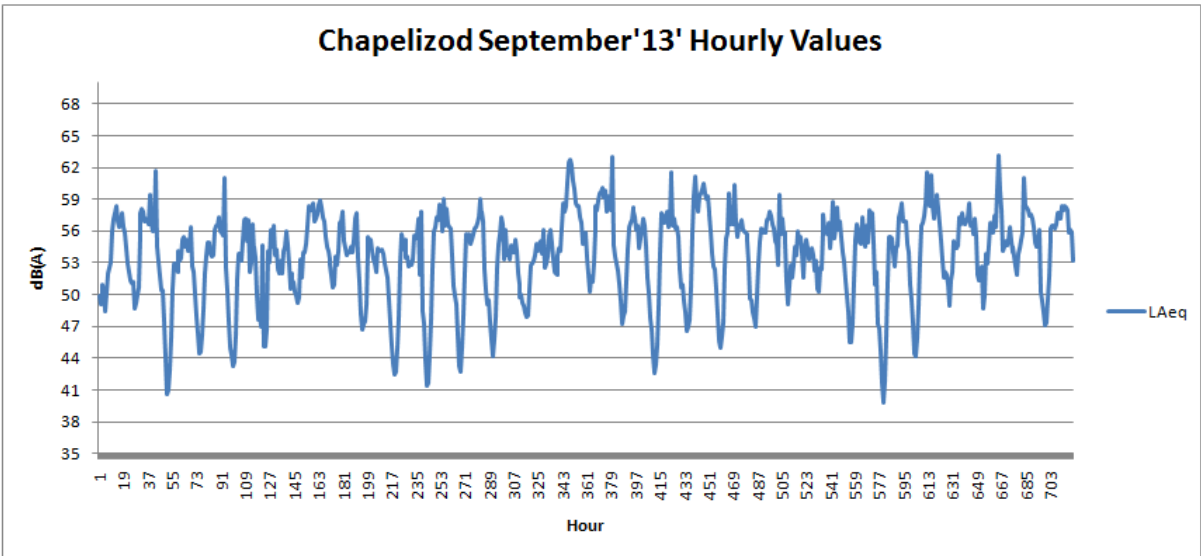
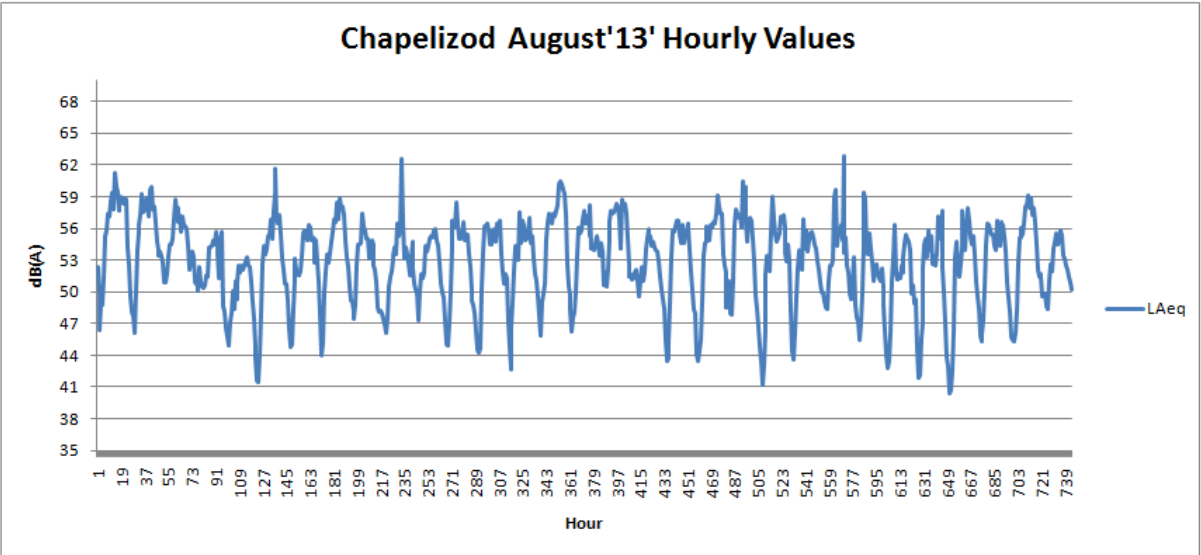
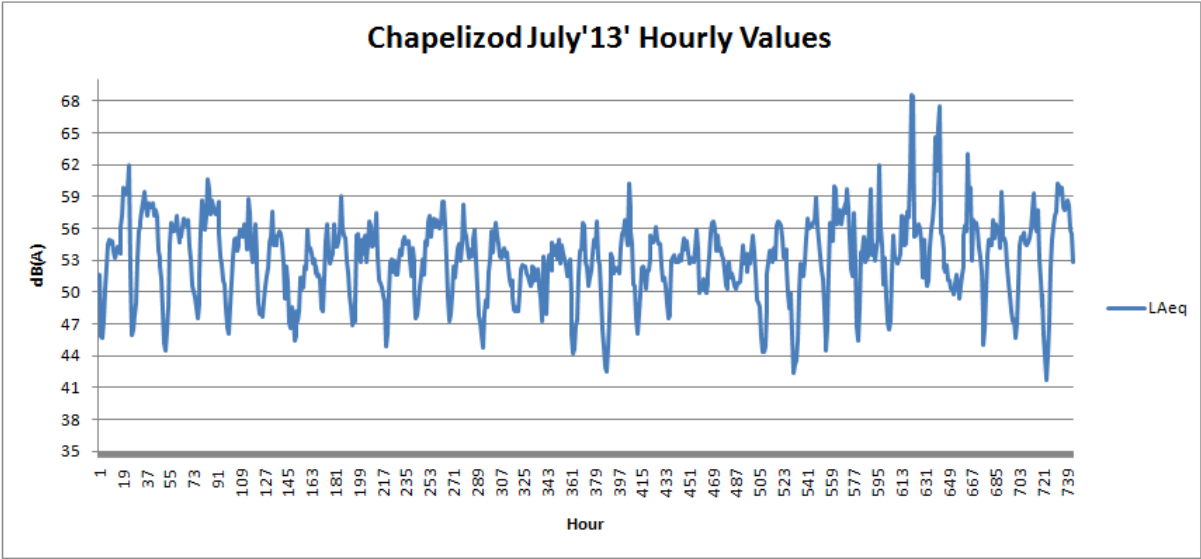
DUBLIN CITY COUNCIL ROWING CLUB
CHAPELIZOD ROAD
DUBLIN 8

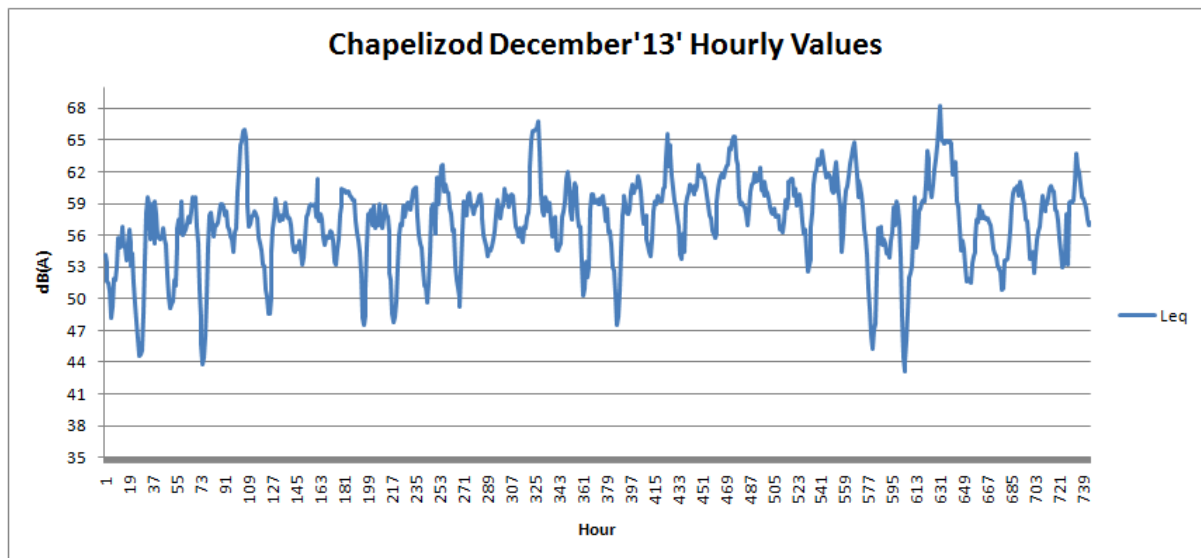
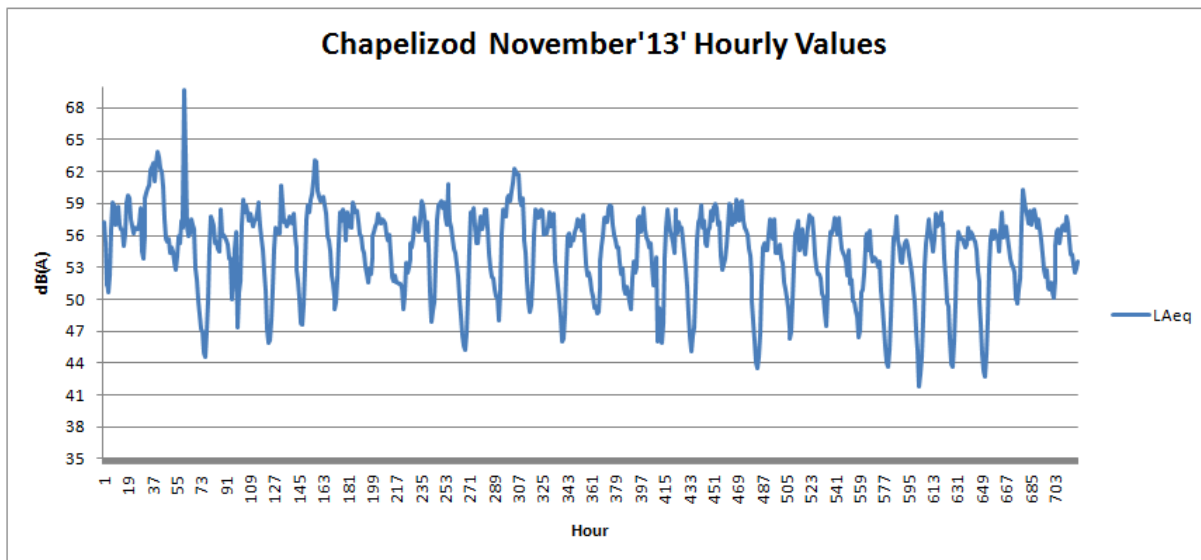
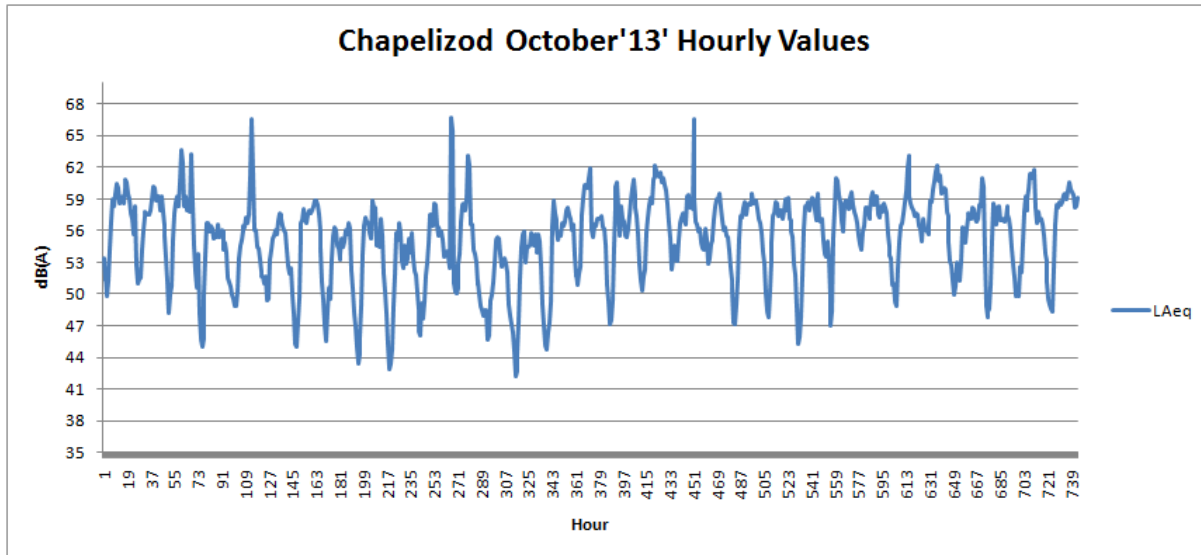






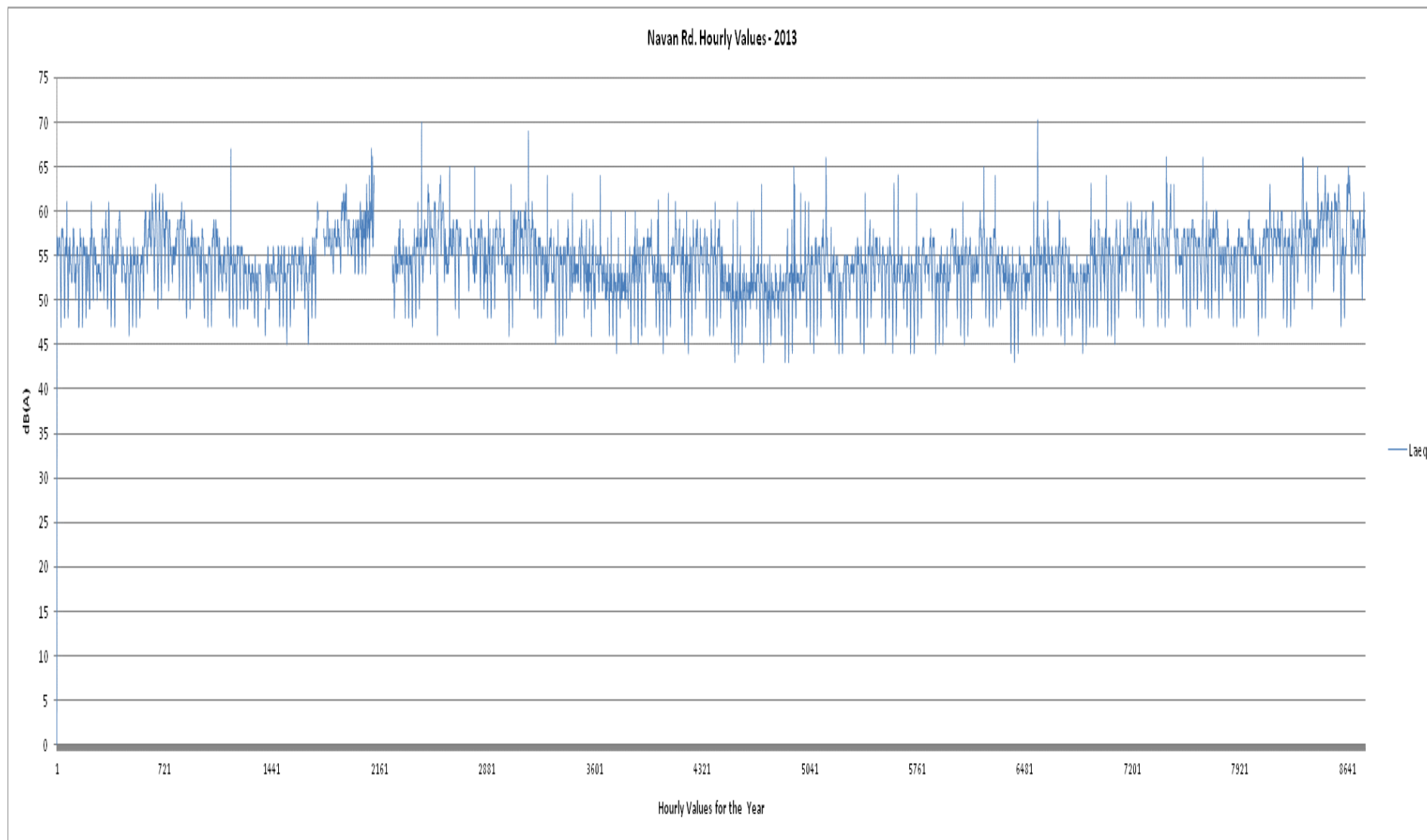


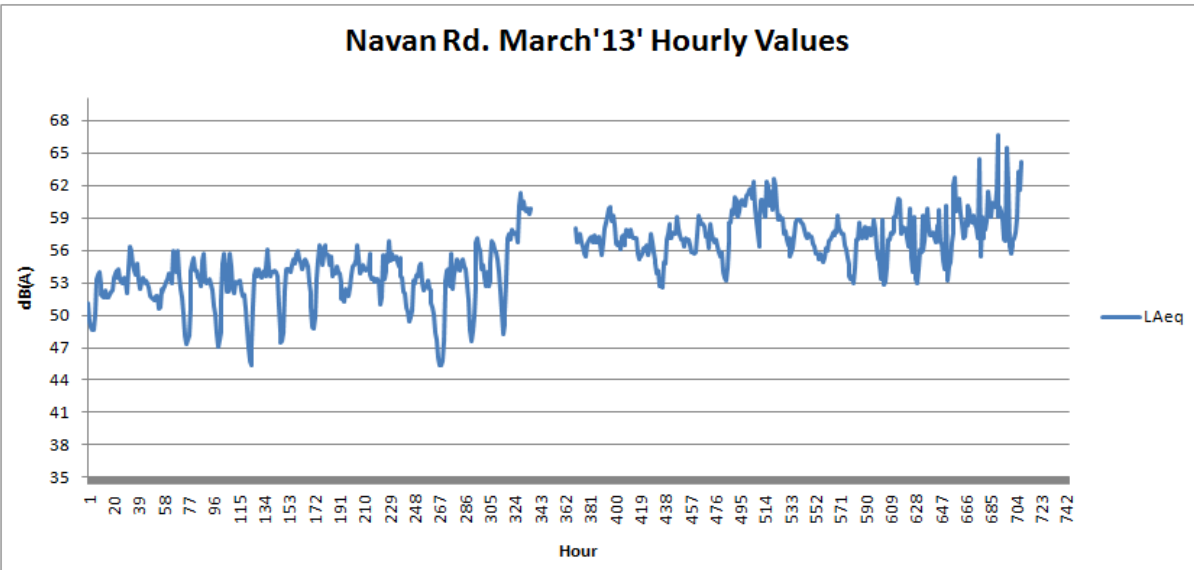
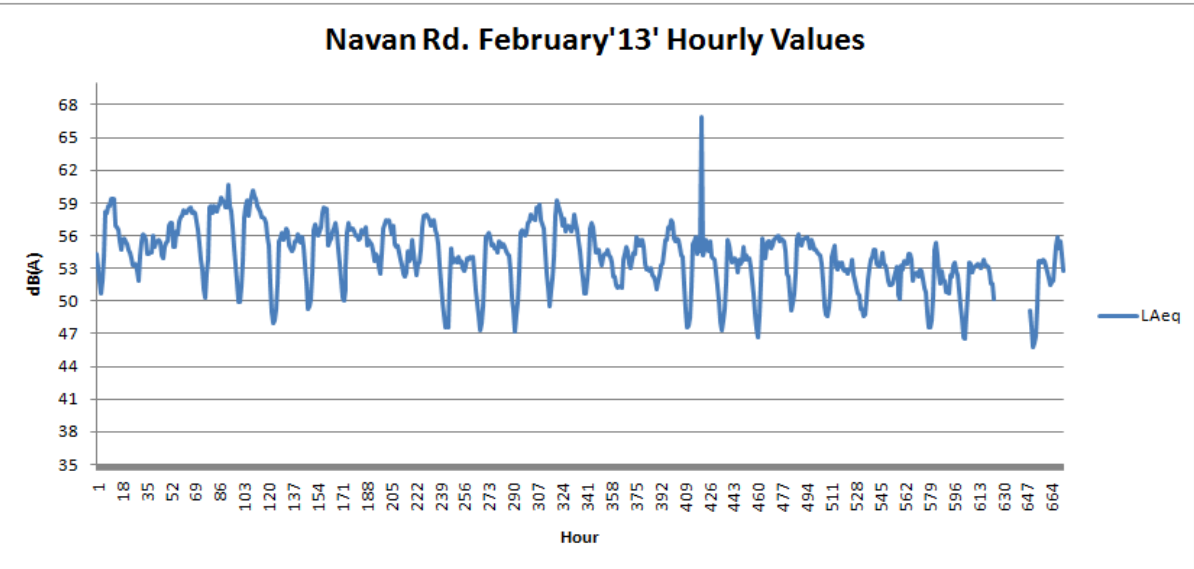
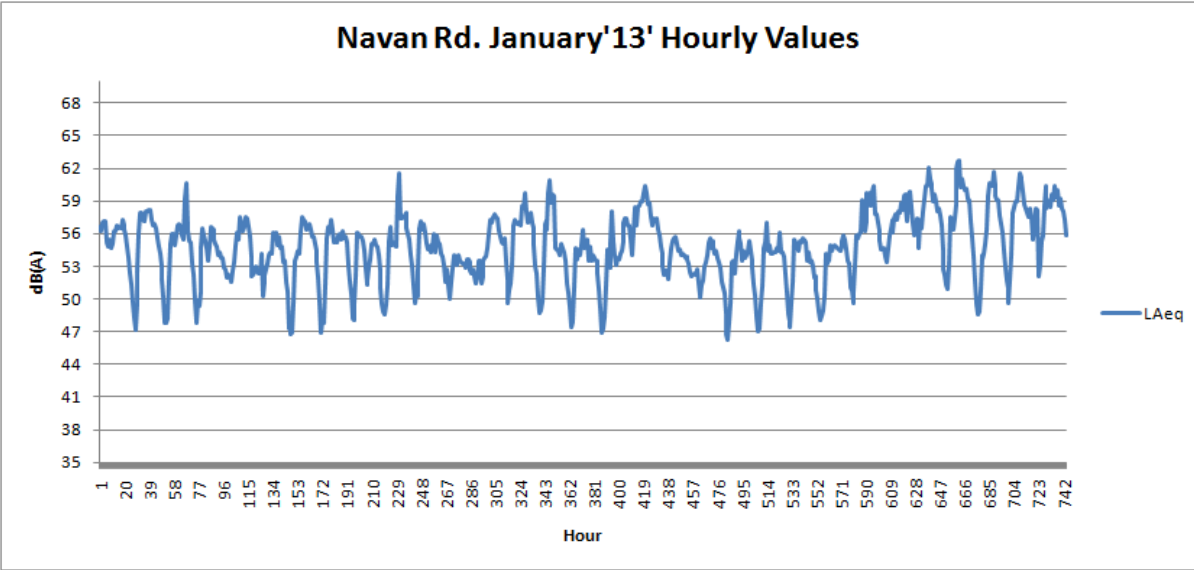


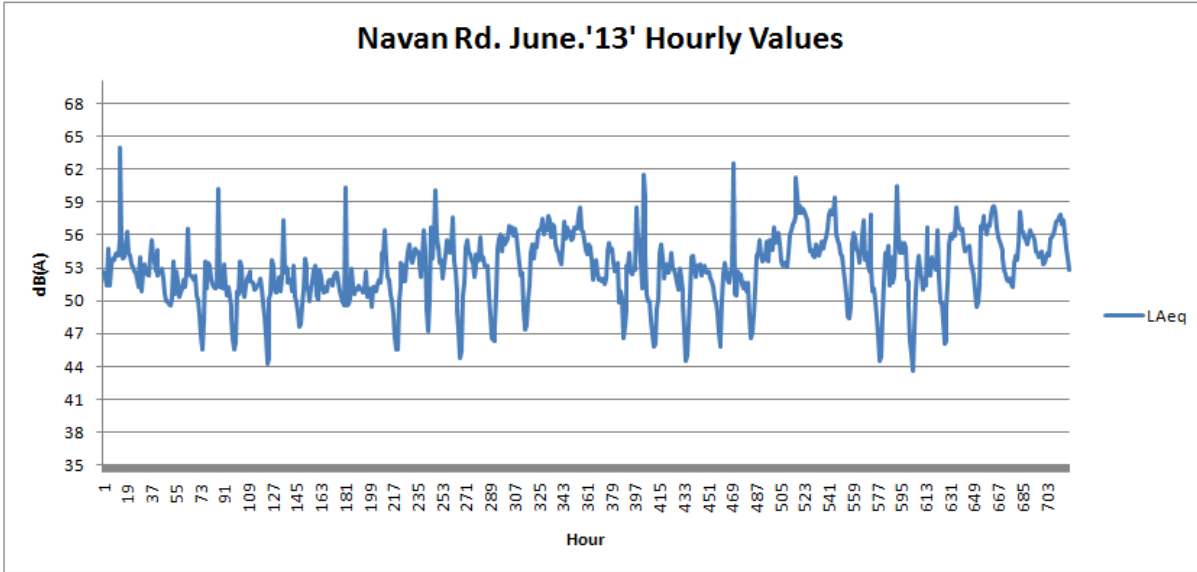
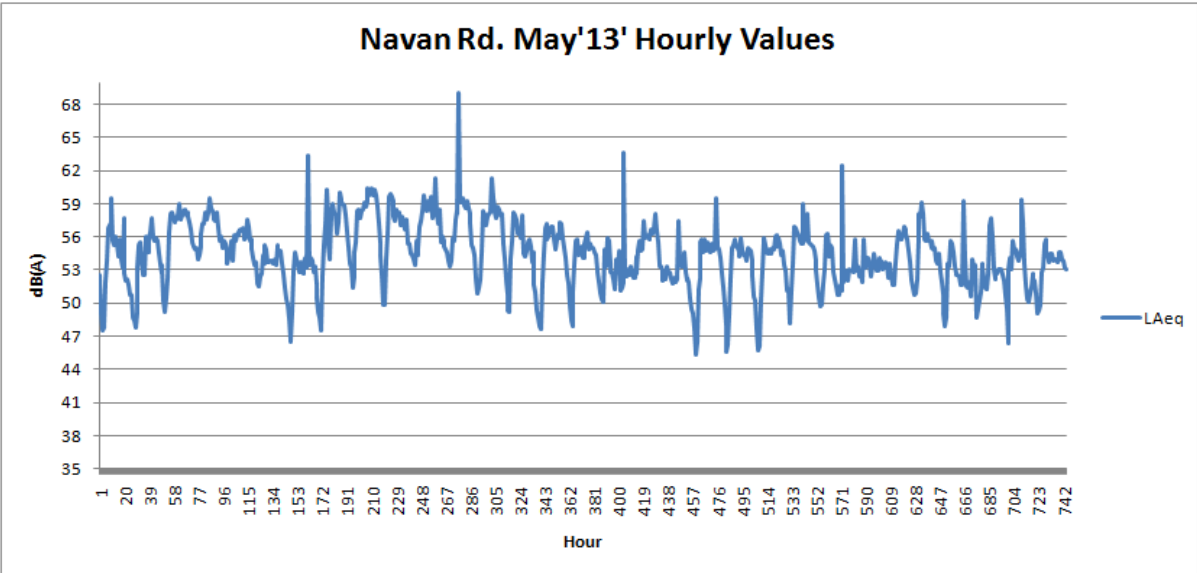
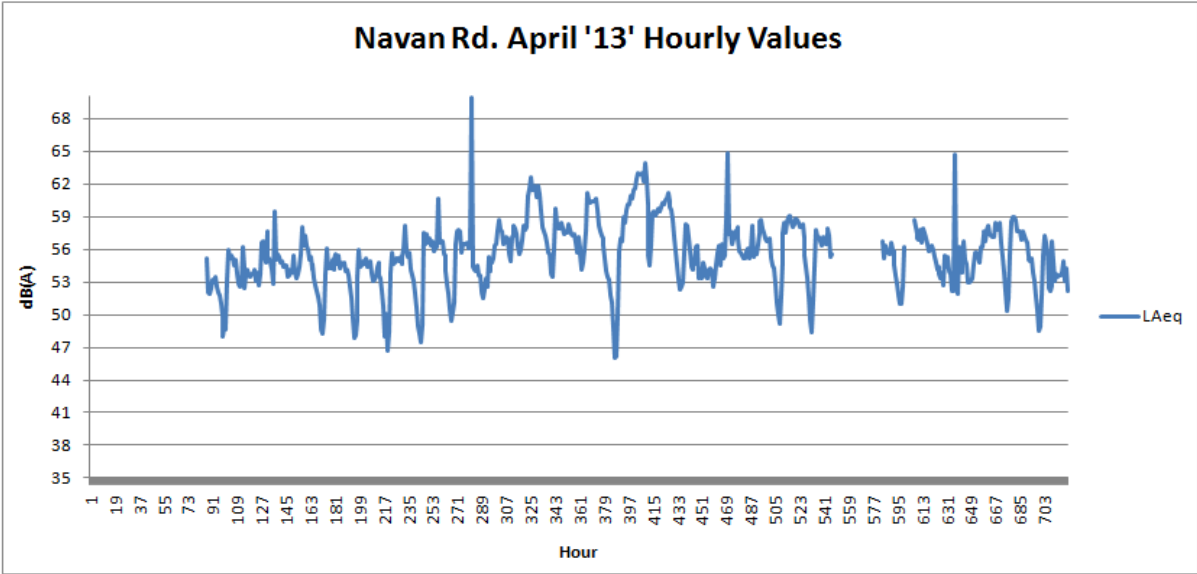


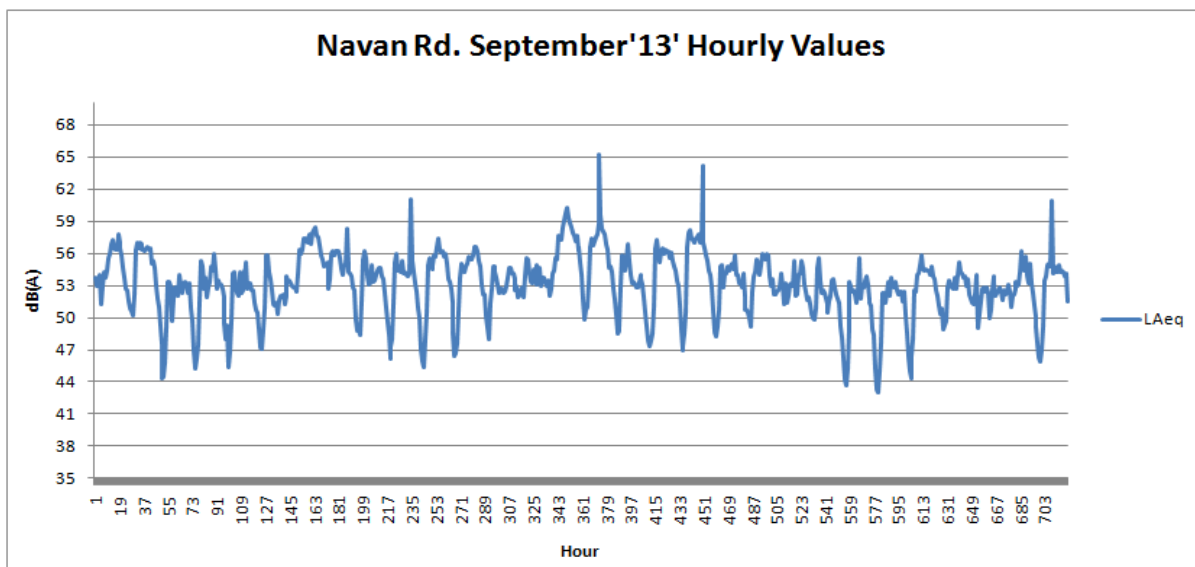
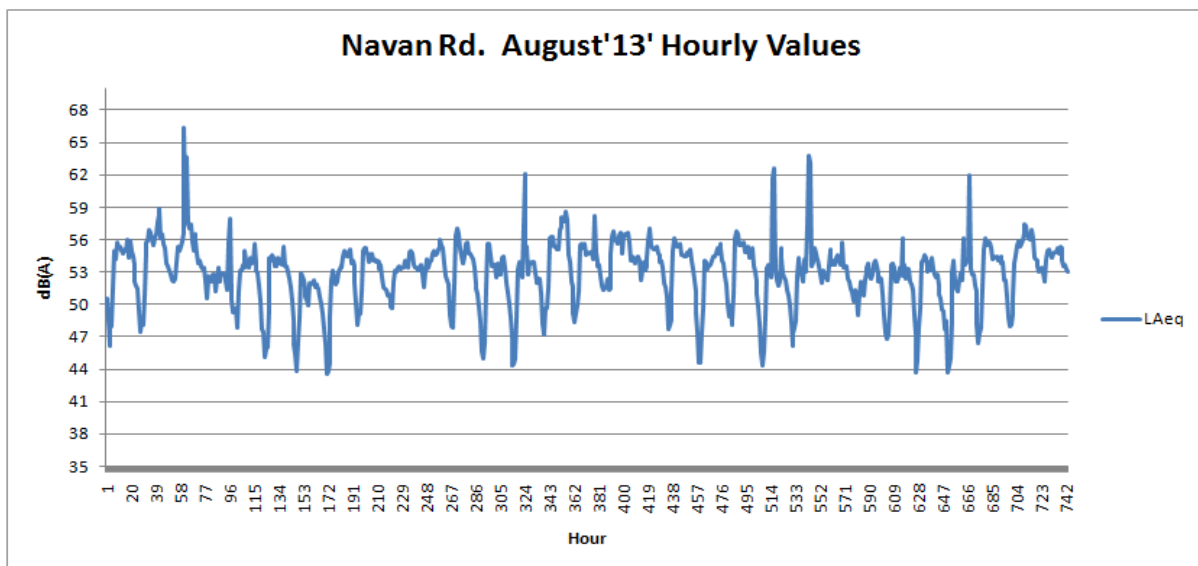
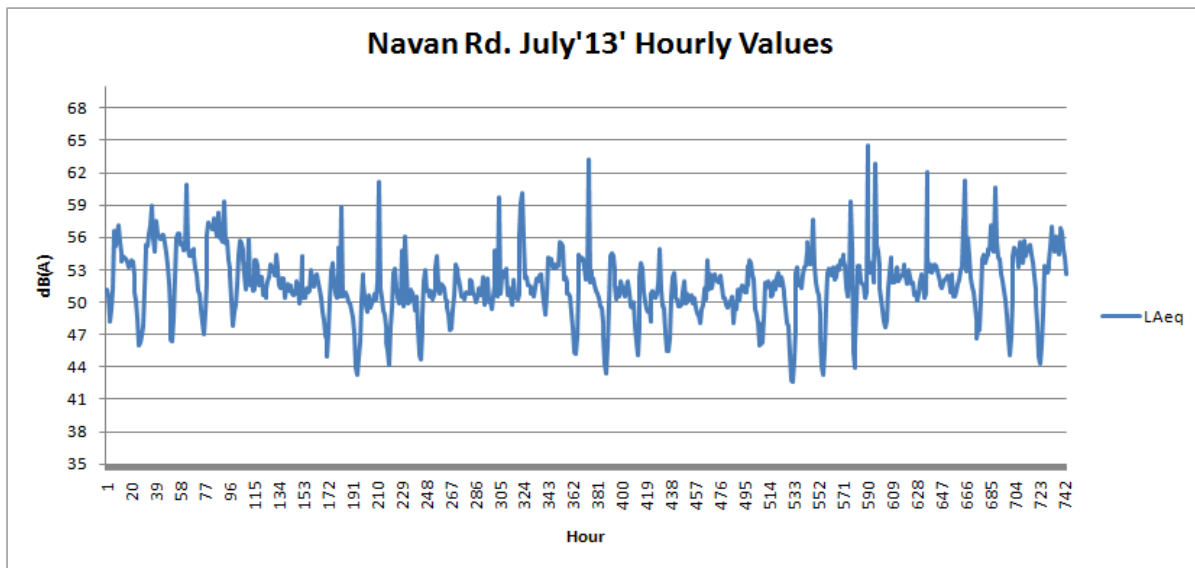
ASHTOWN GROVE
NAVAN ROAD
DUBLIN 7

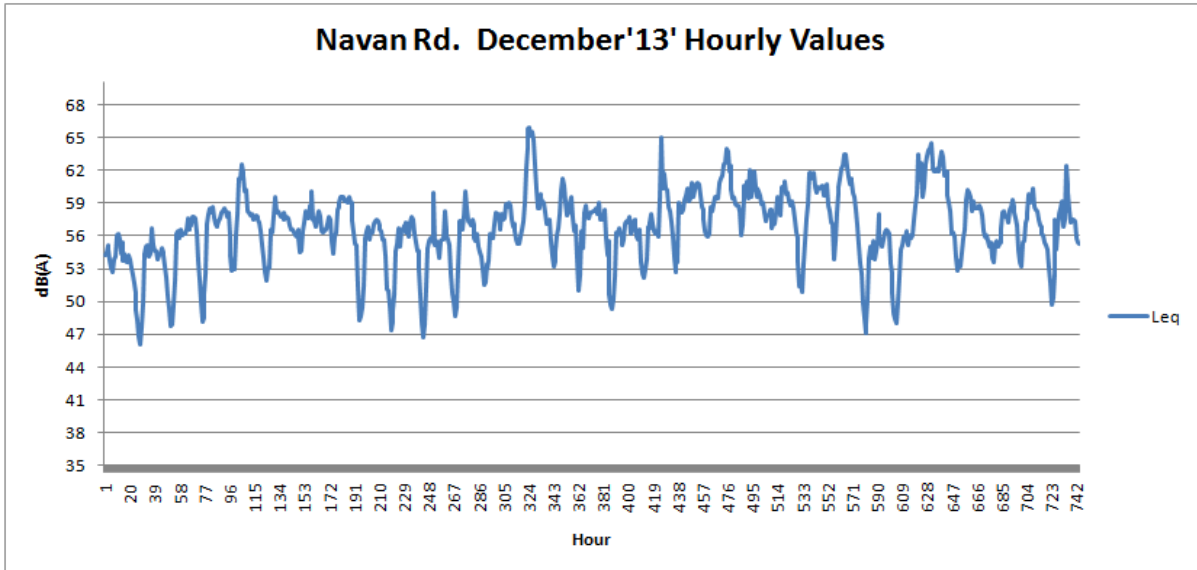
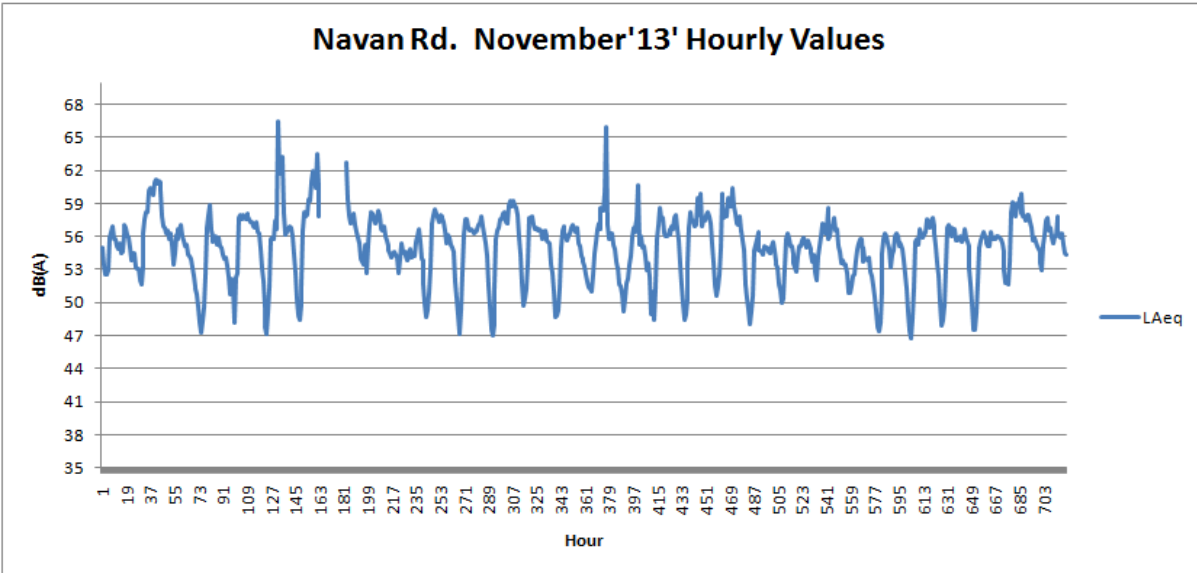
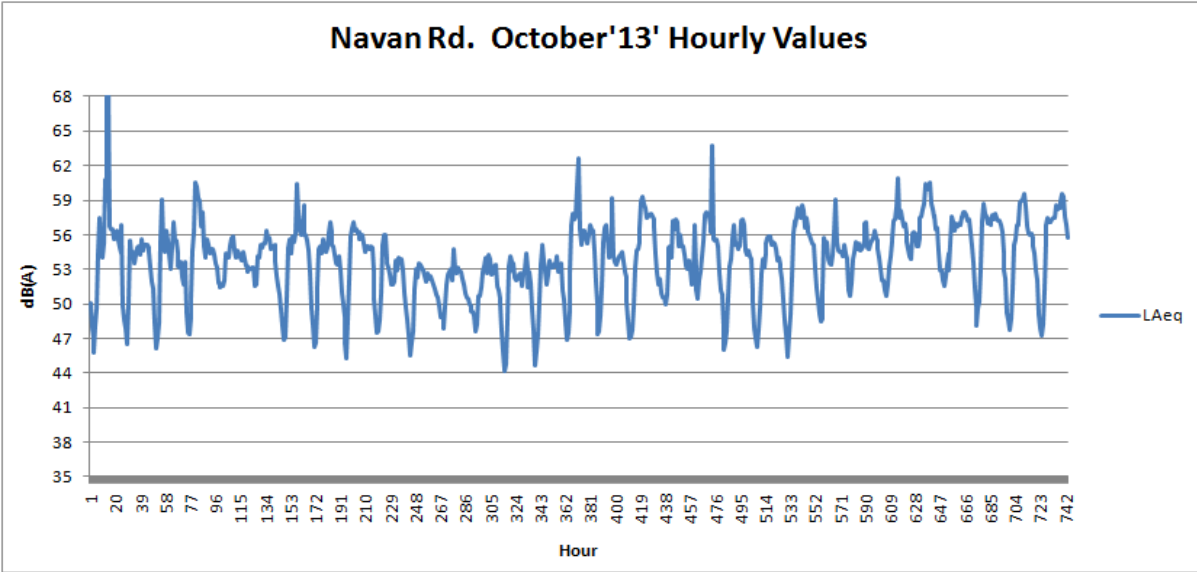




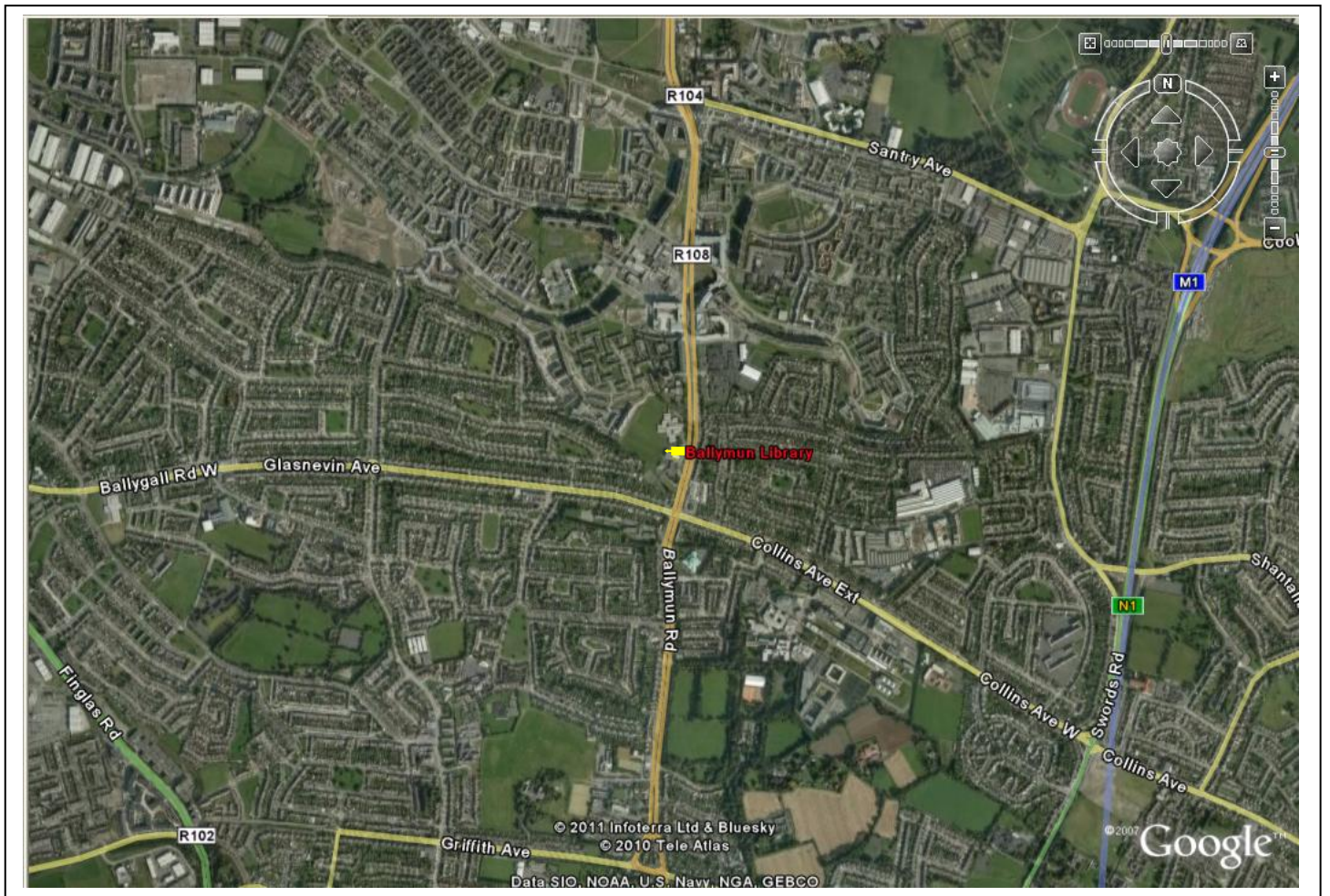


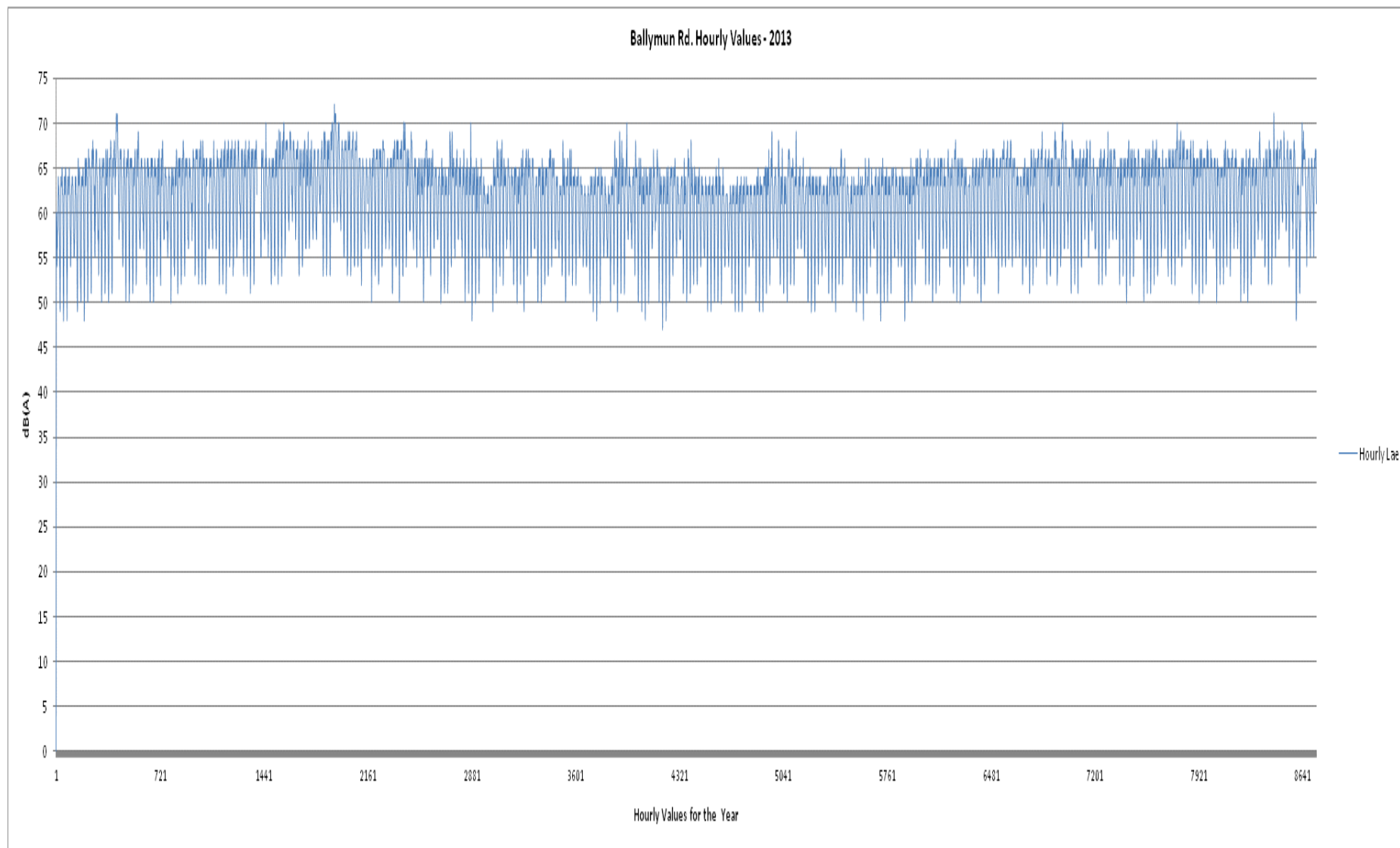


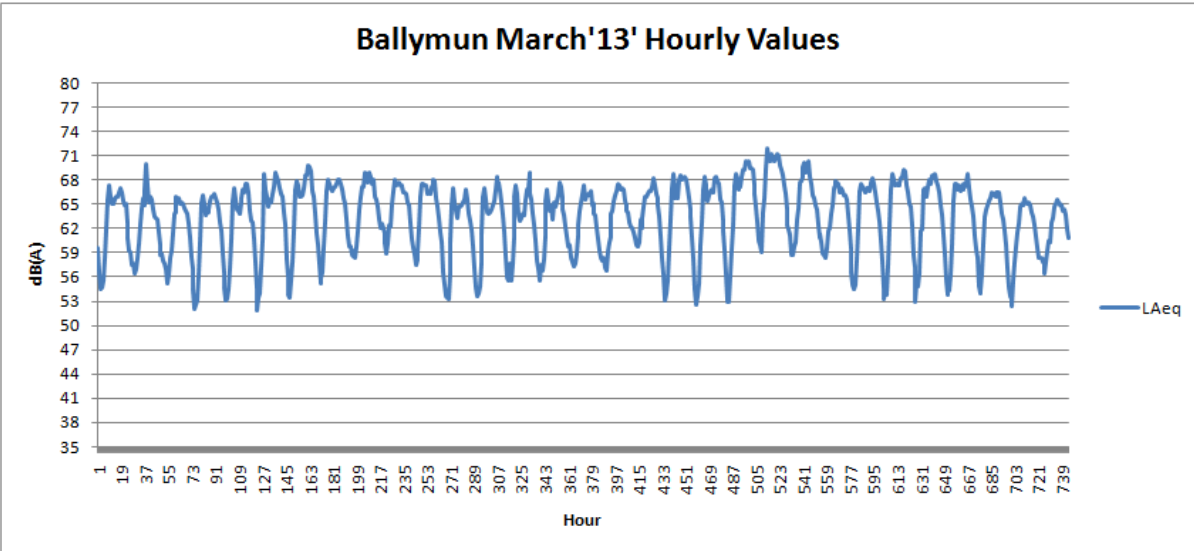
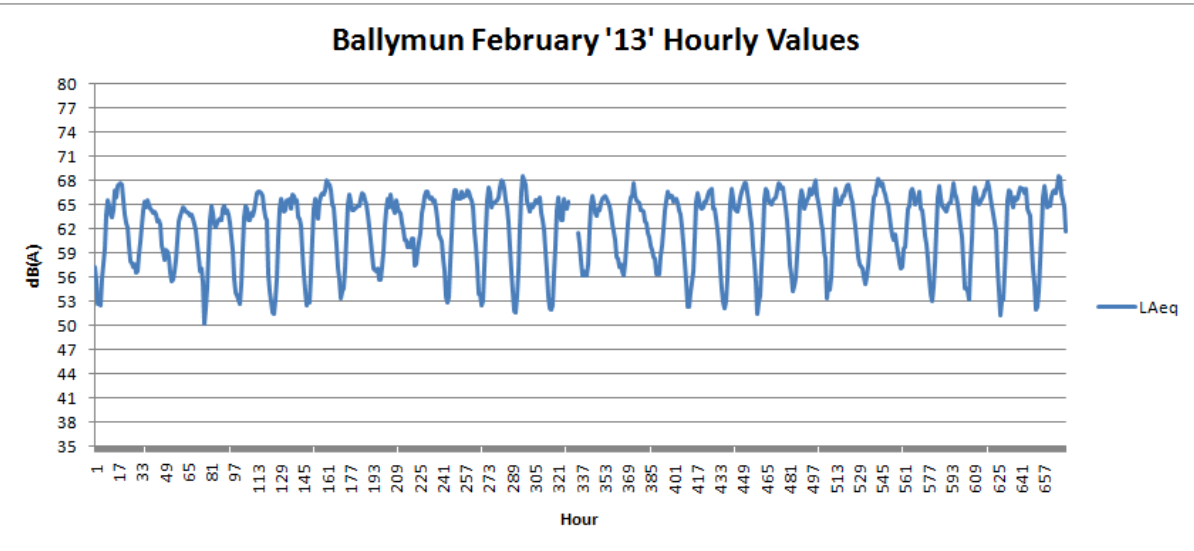
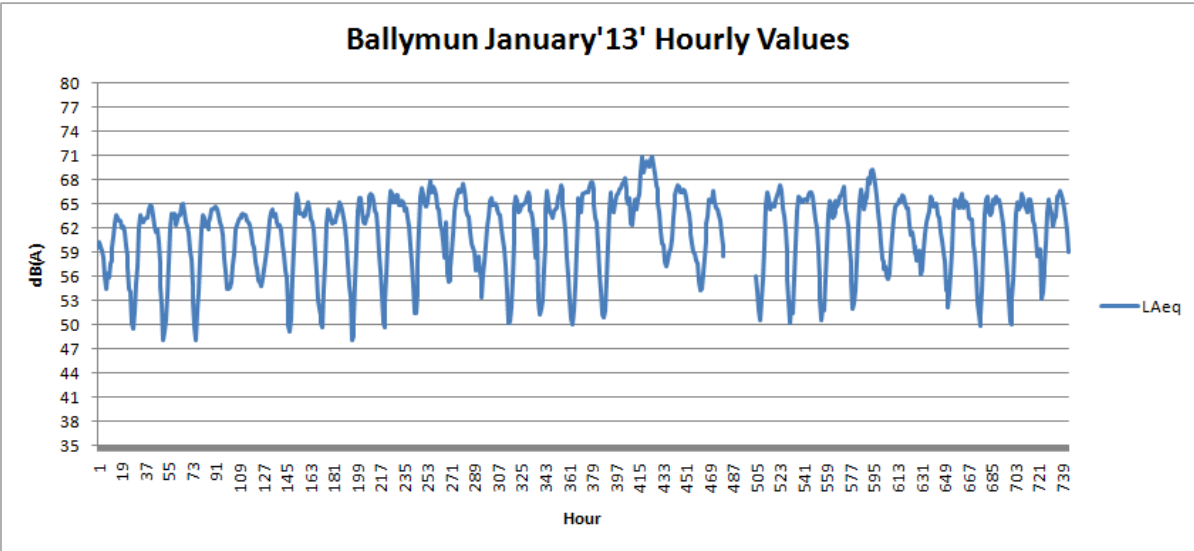


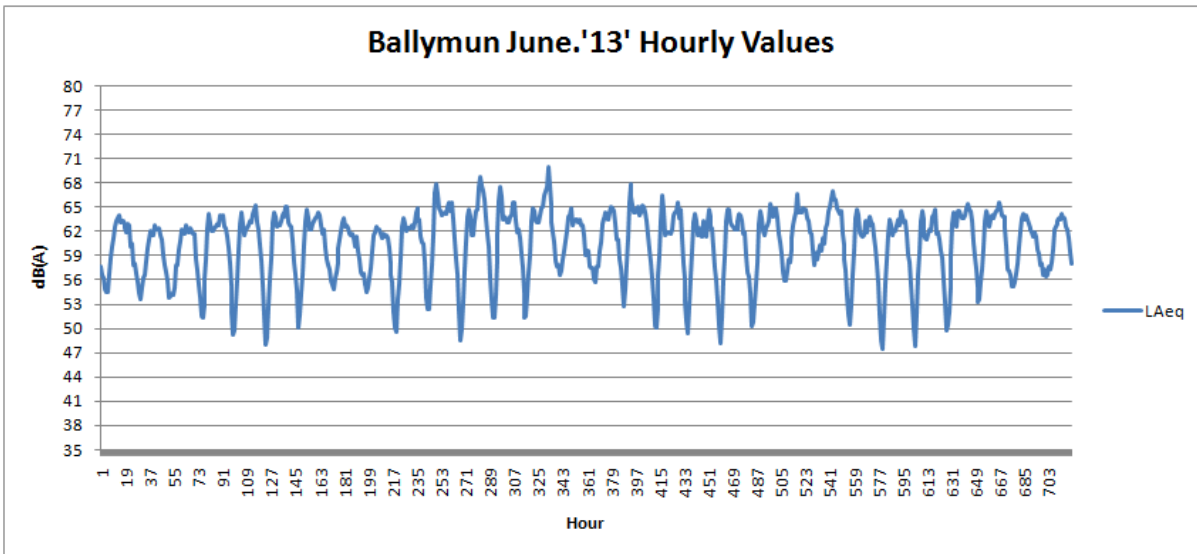
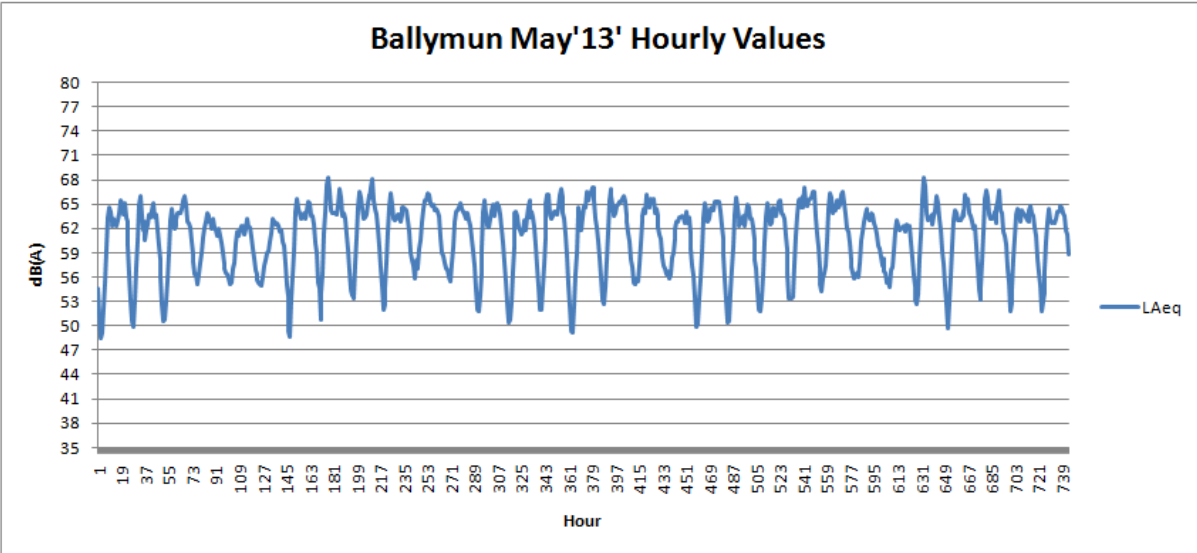
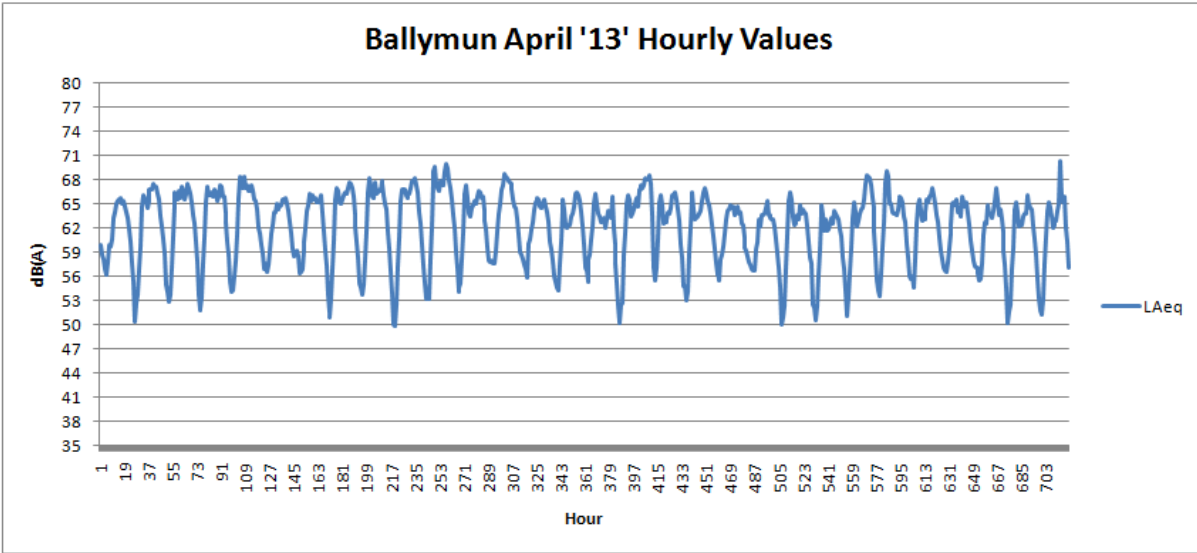


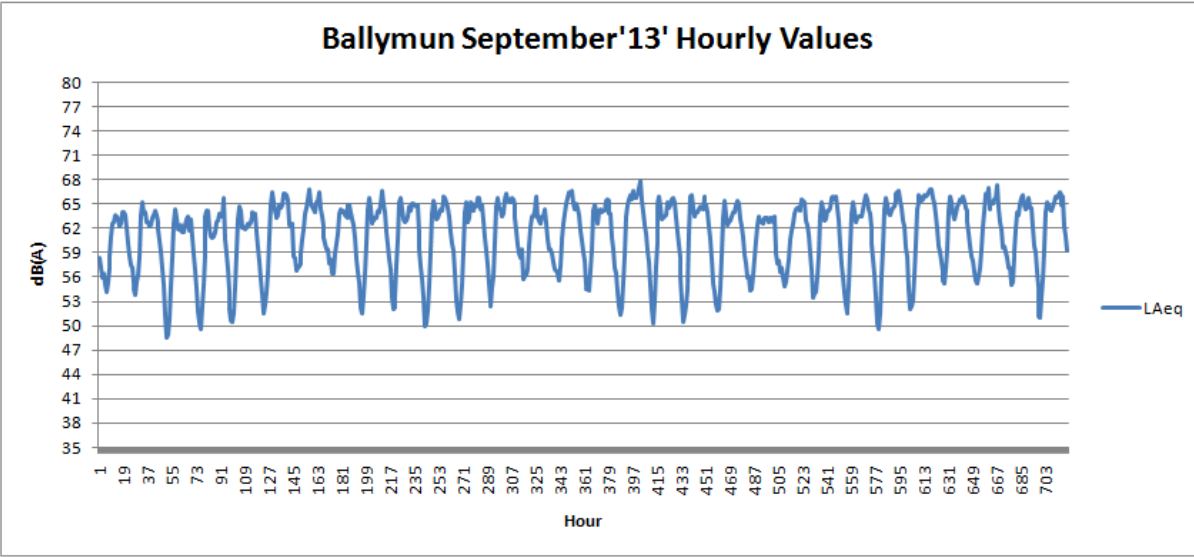
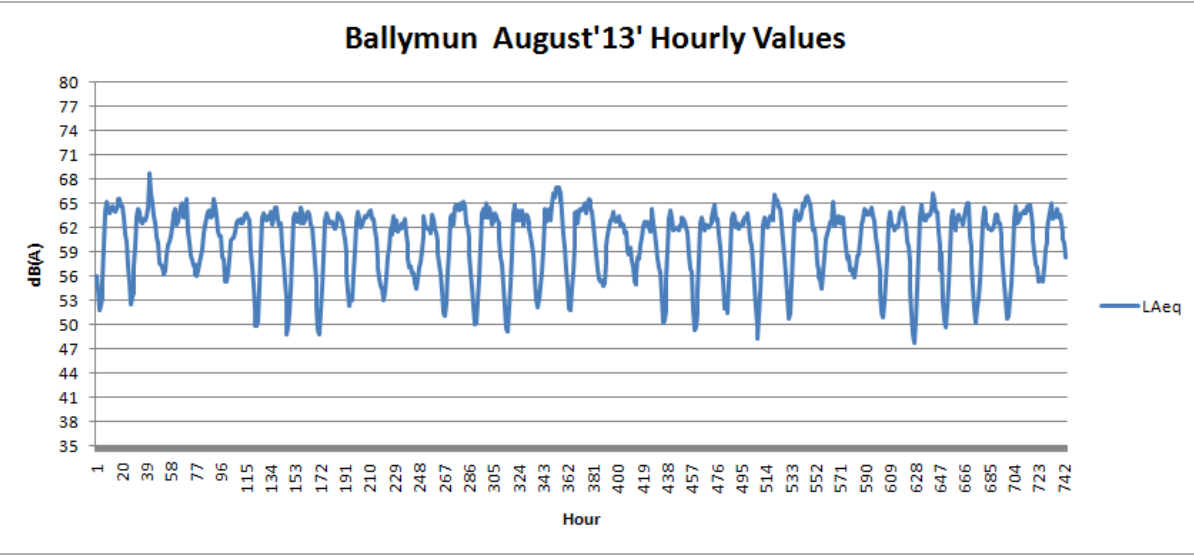
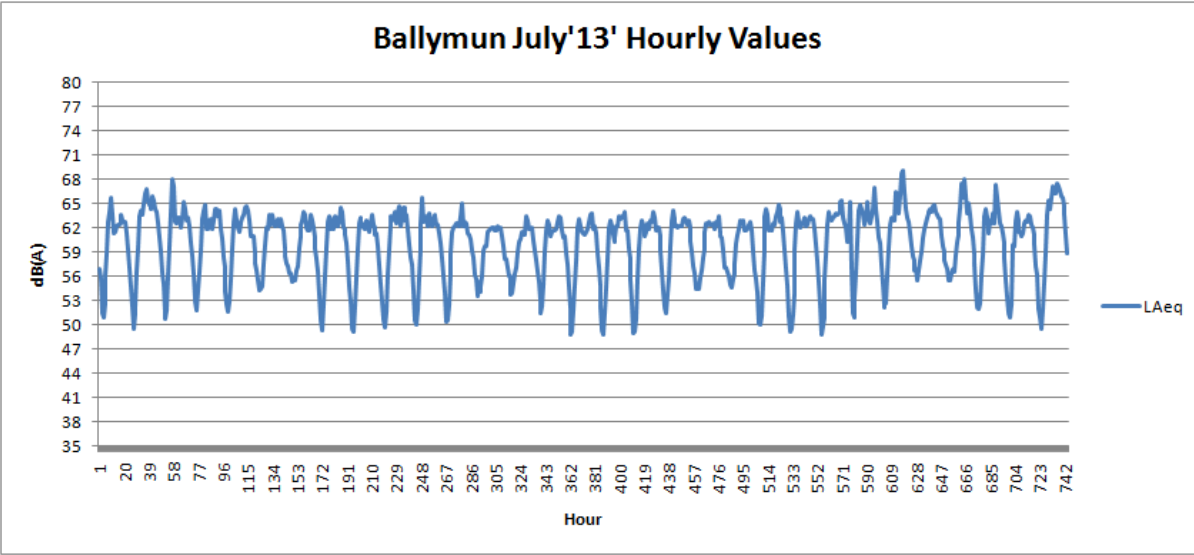
BALLYMUN LIBRARY
BALLYMUN ROAD
DUBLIN 11

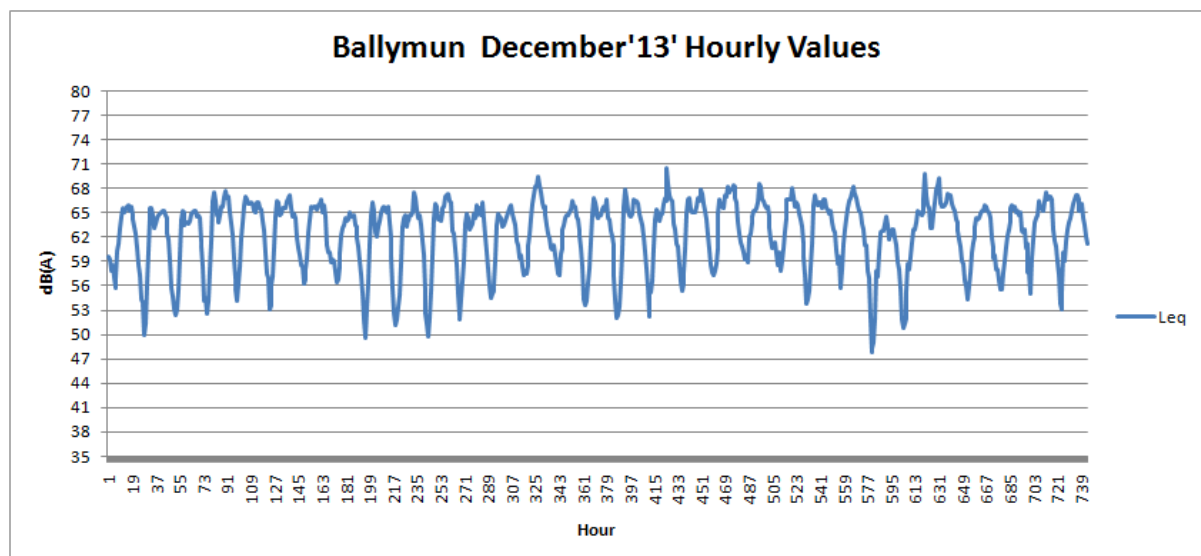
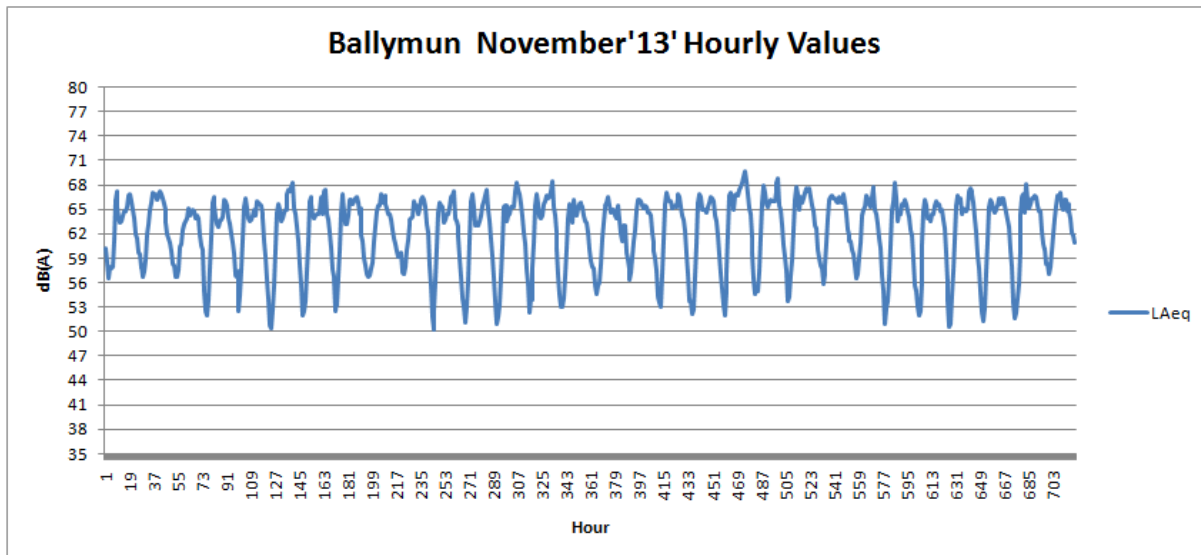
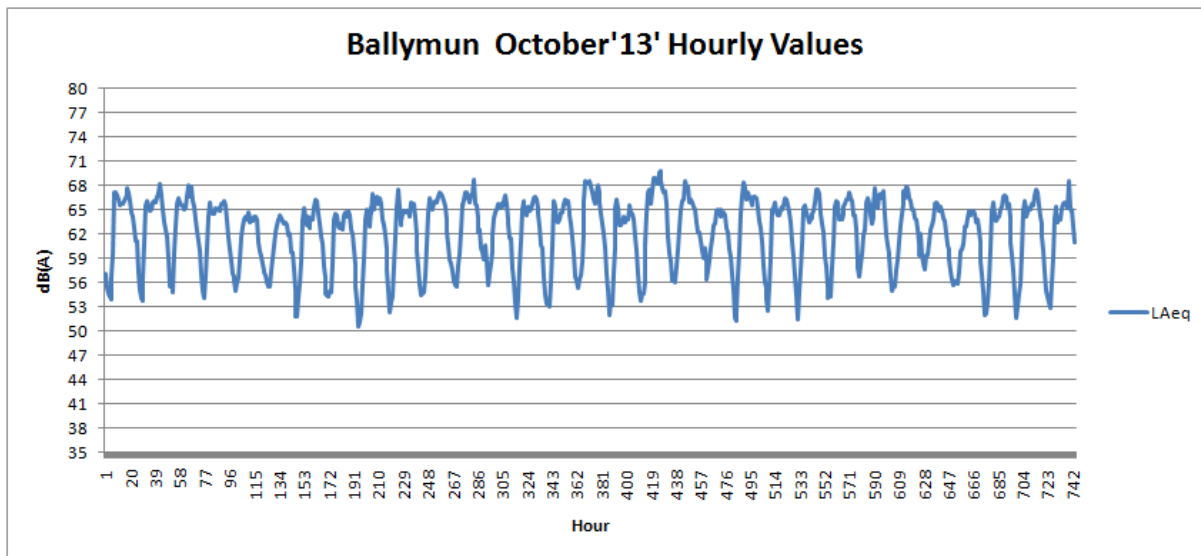






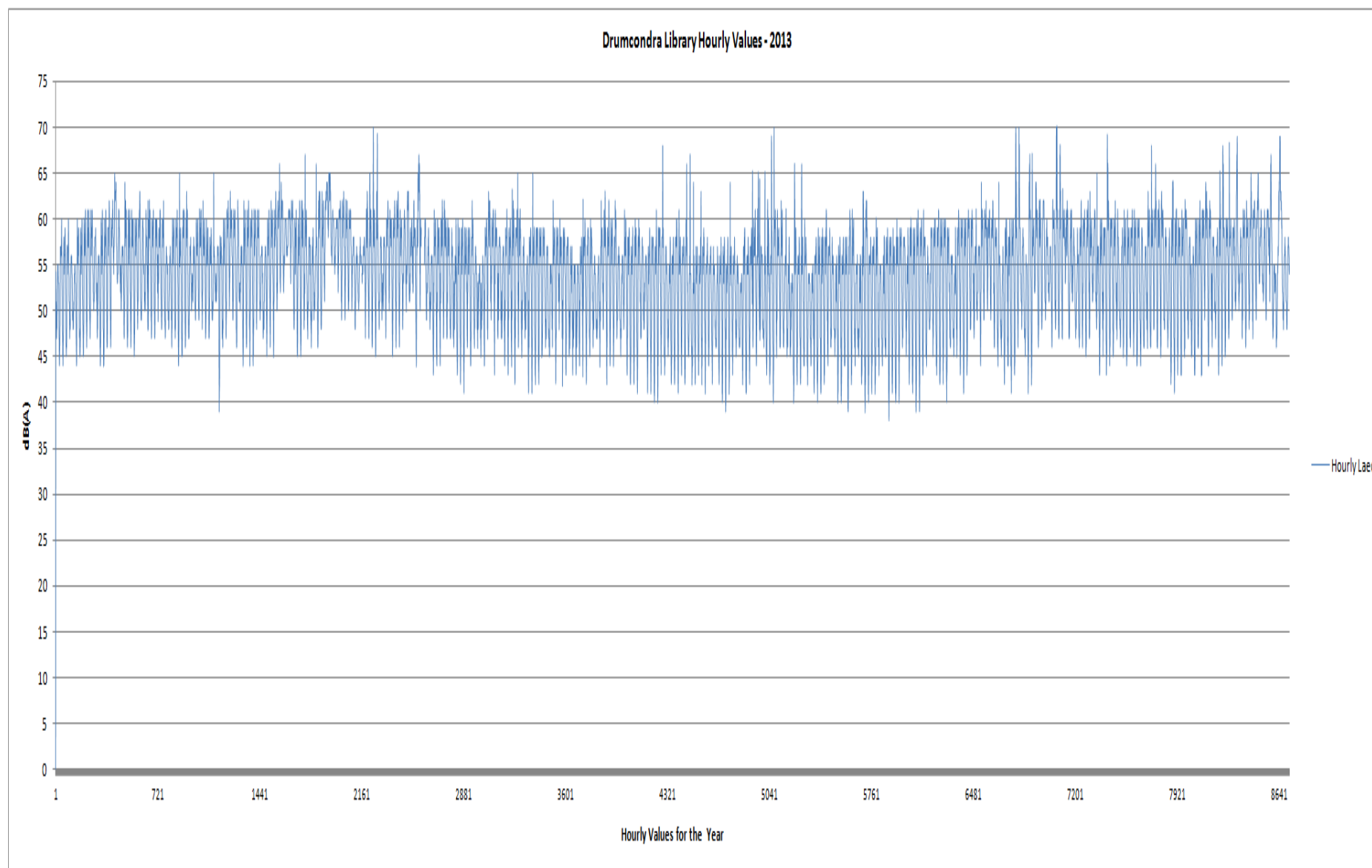




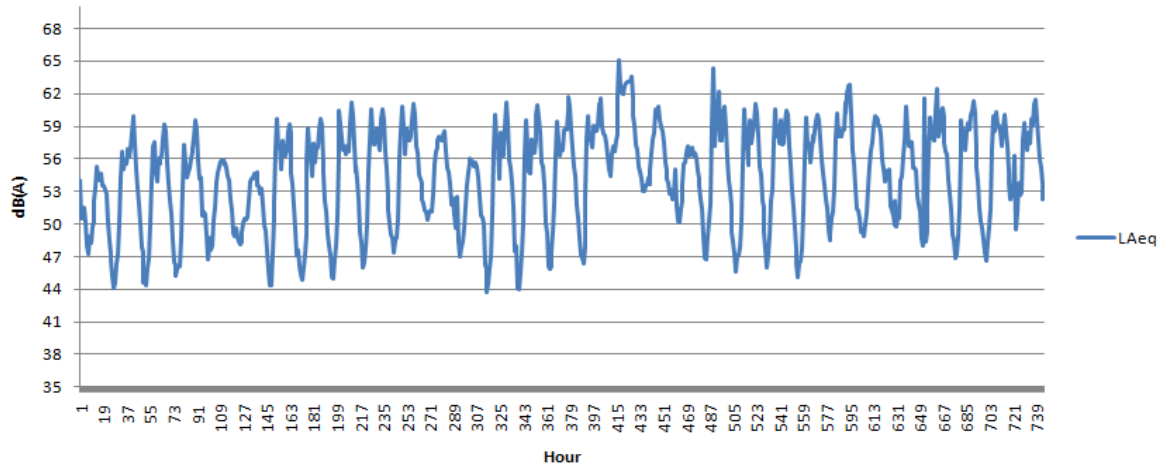


DRUMCONDRA LIBRARY
MILLMOUNT AVENUE
DUBLIN 9

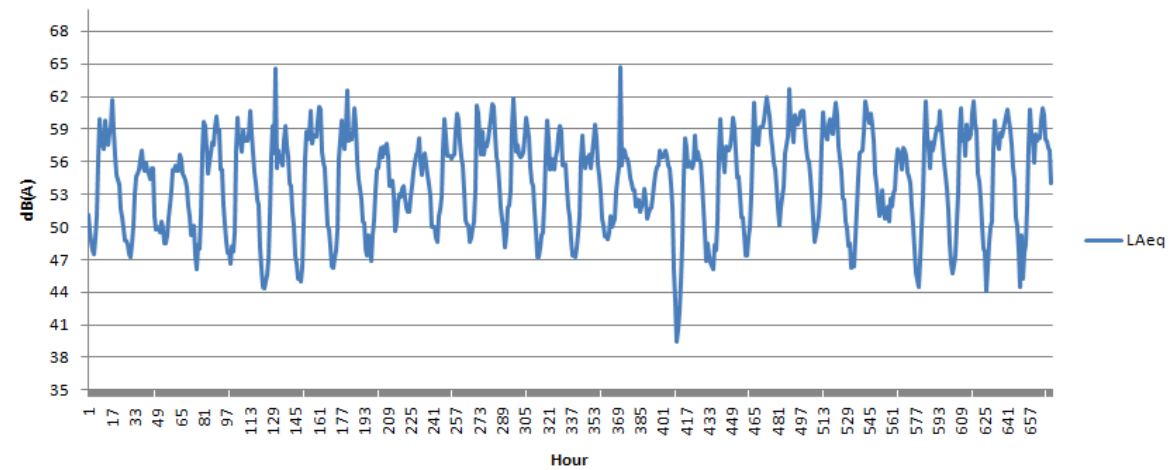




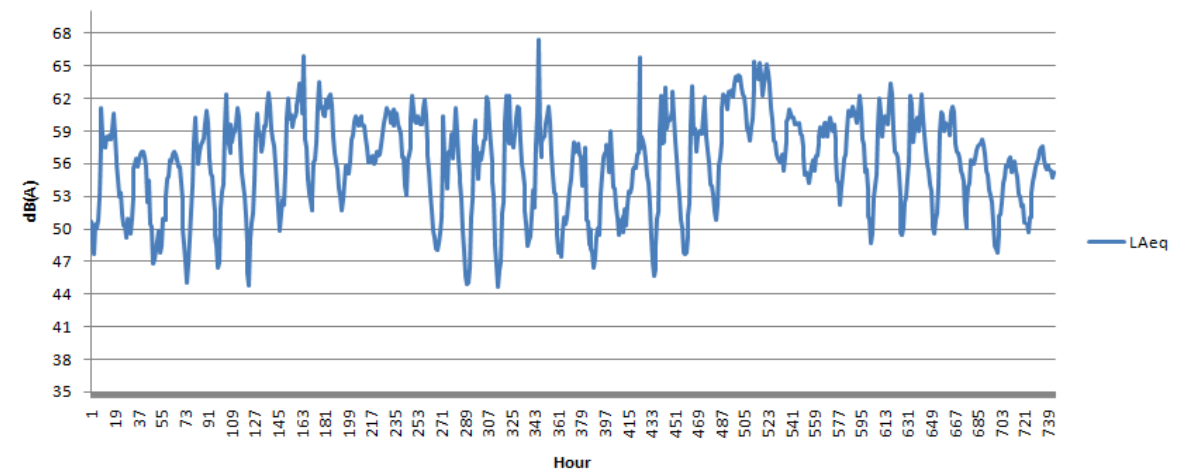
Drumcondra January'13' Hourly Values

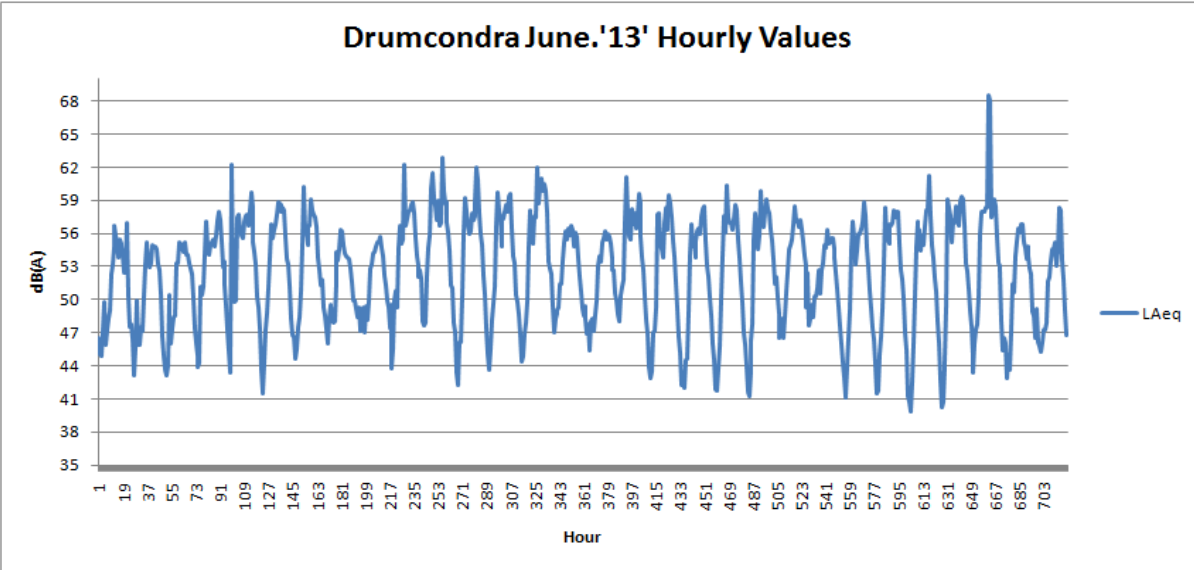
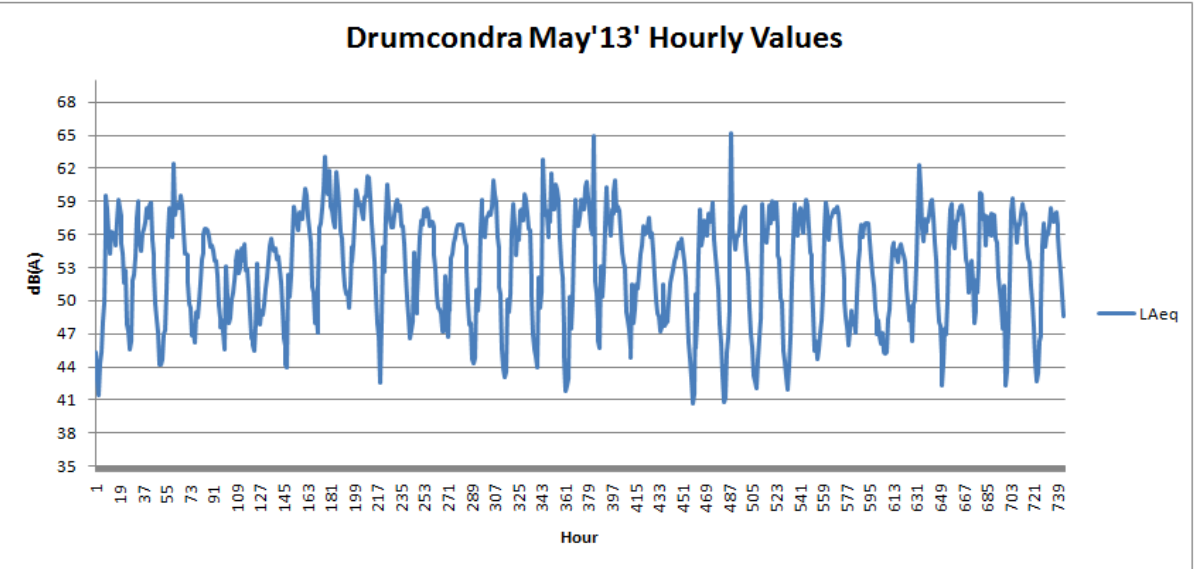
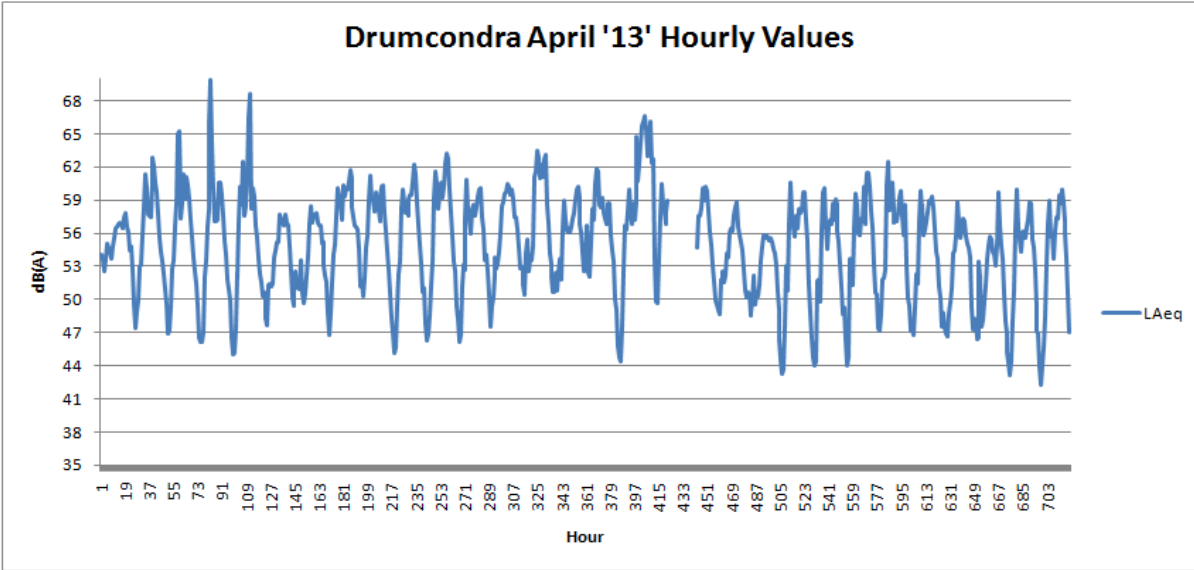


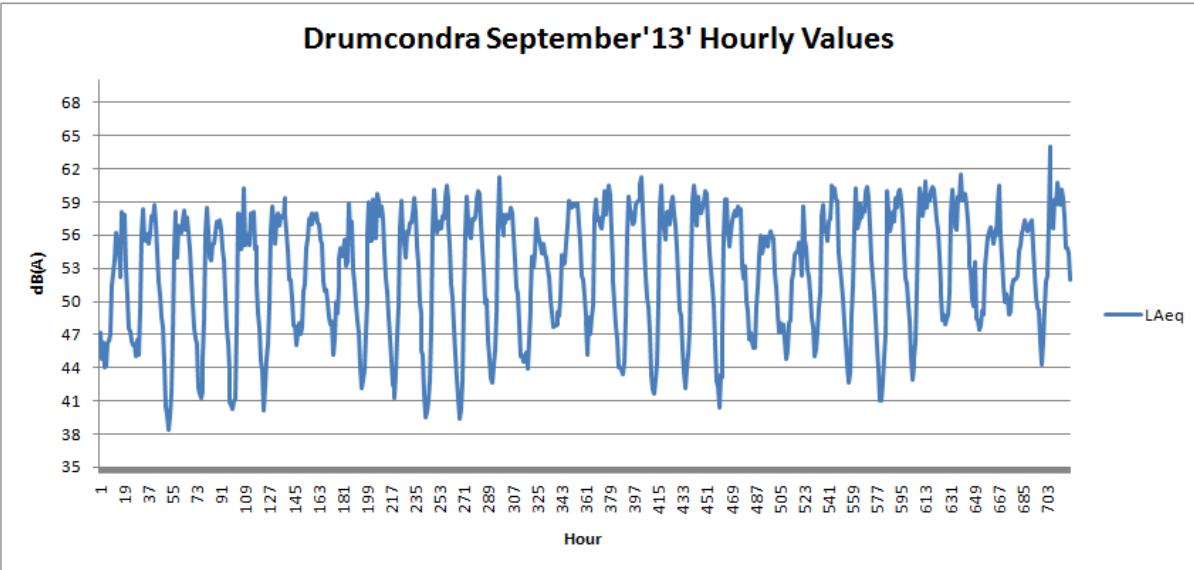
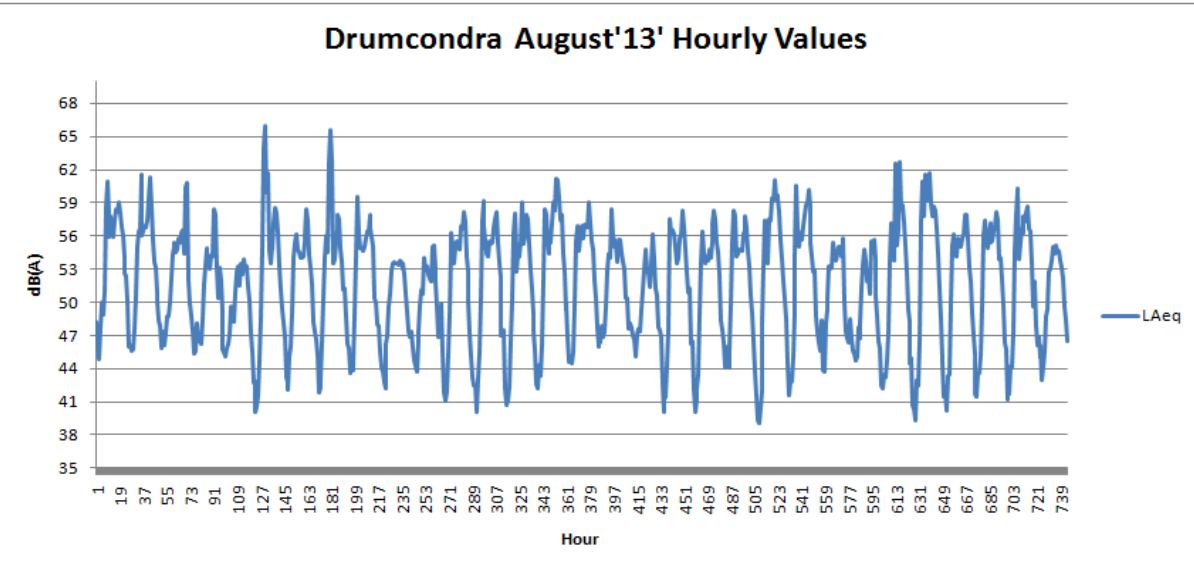
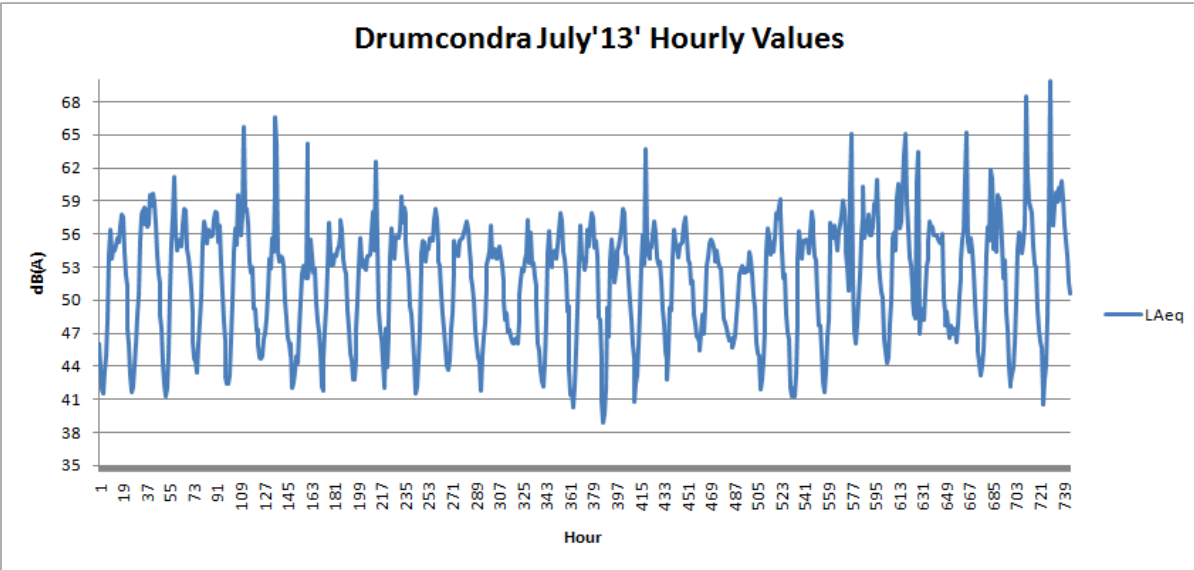
Drumcondra February'13' Hourly Values

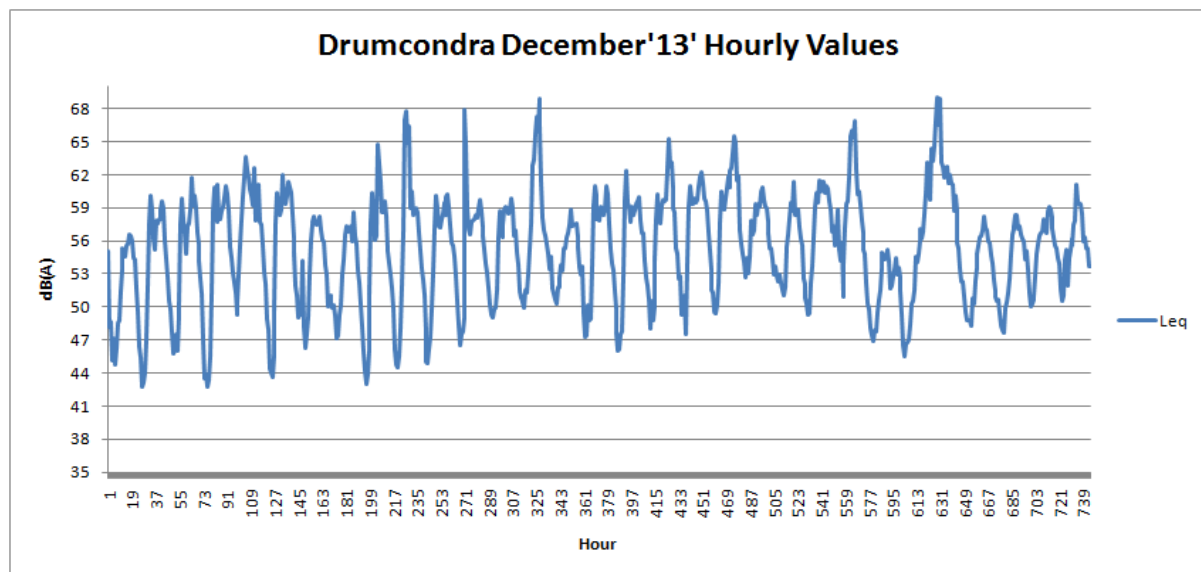
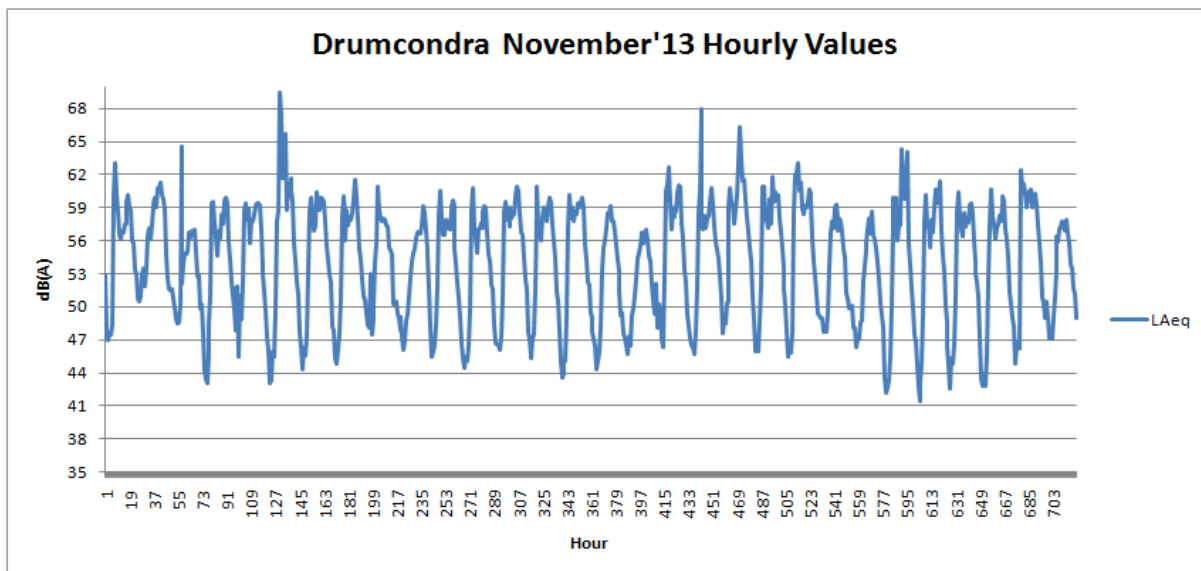
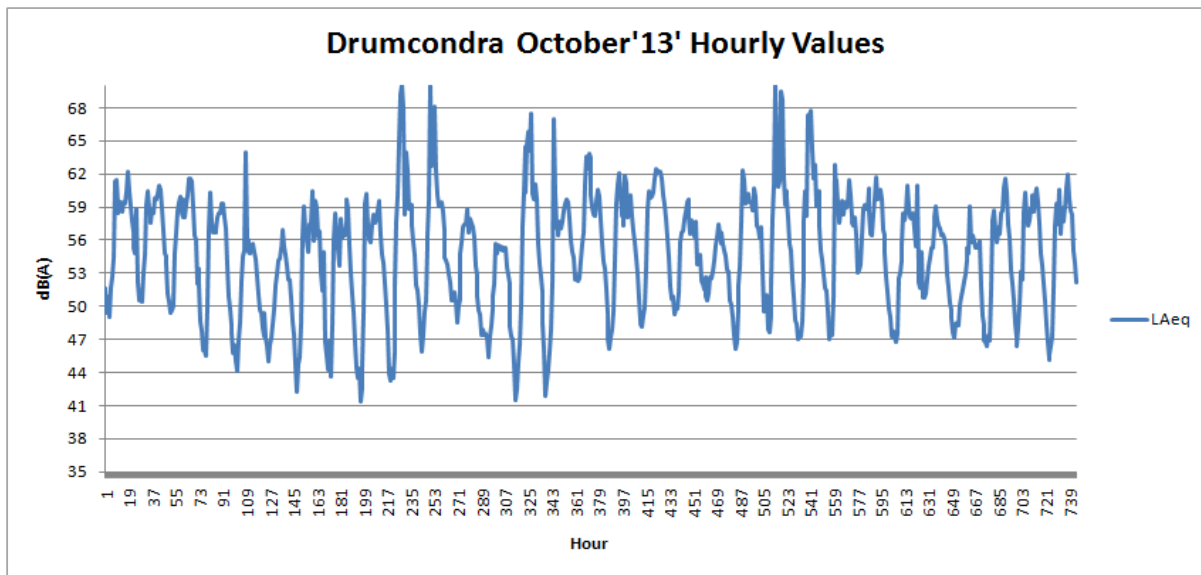


Drumcondra March'13' Hourly Values



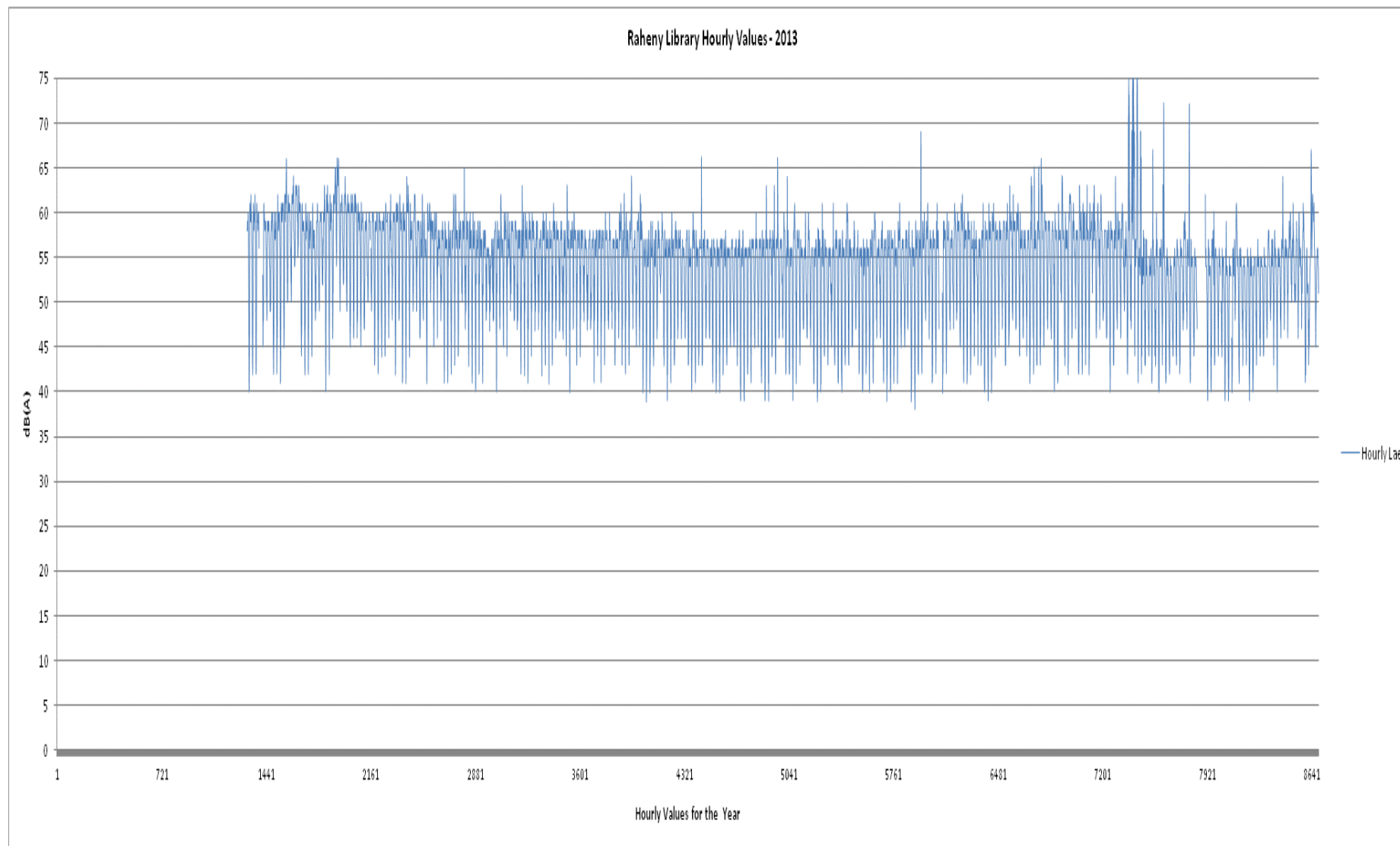


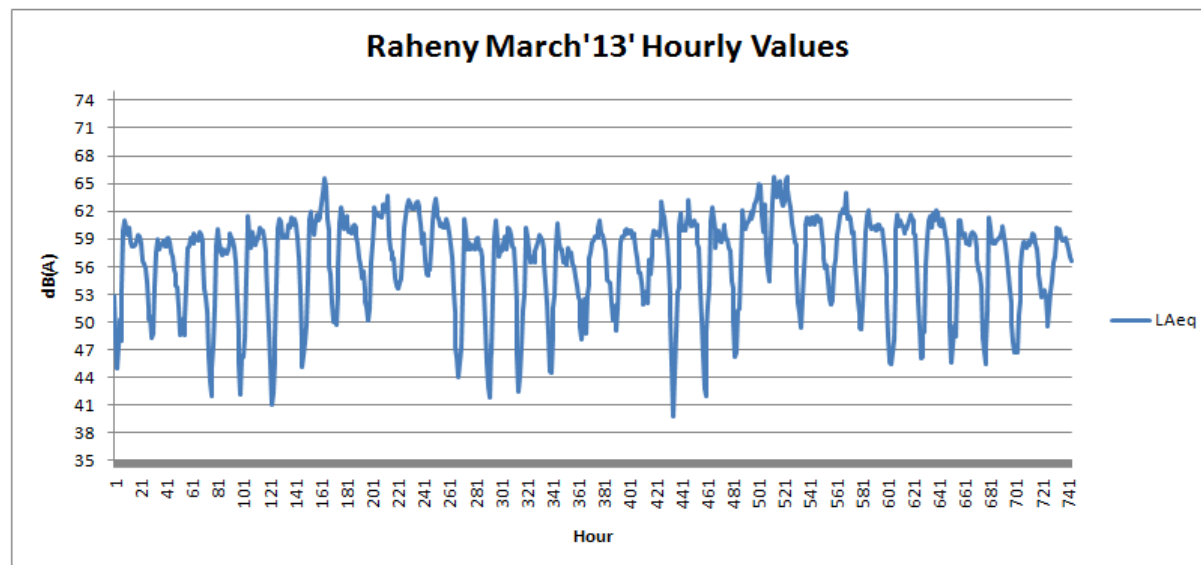
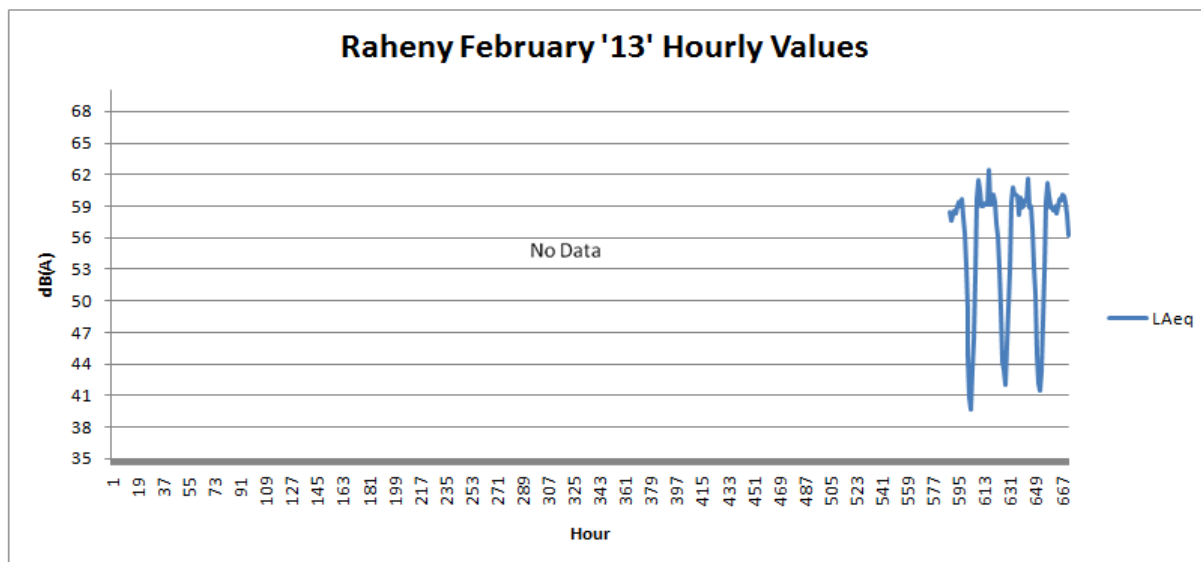
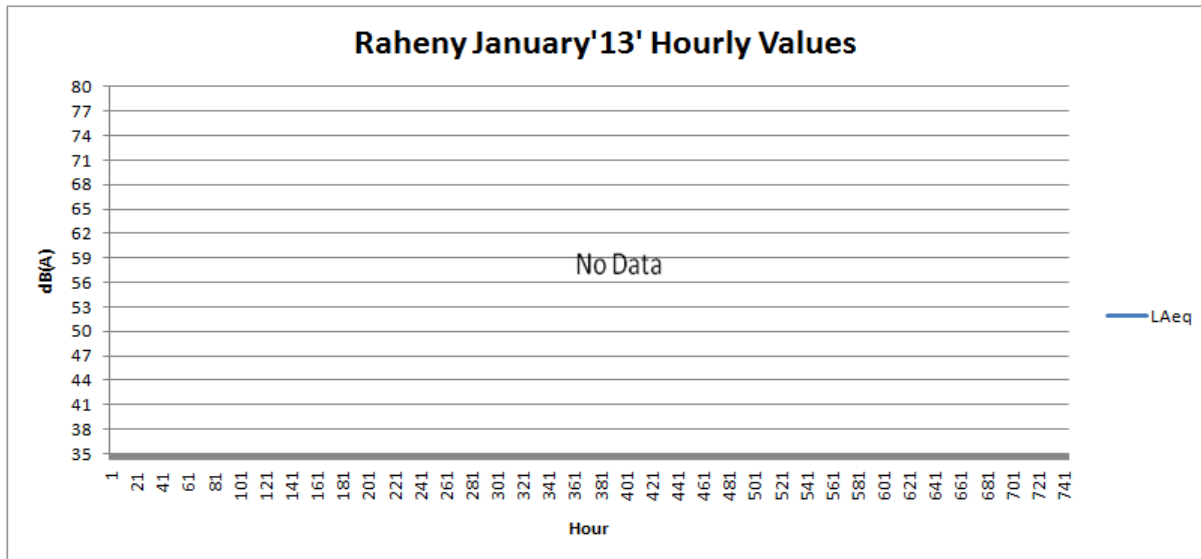




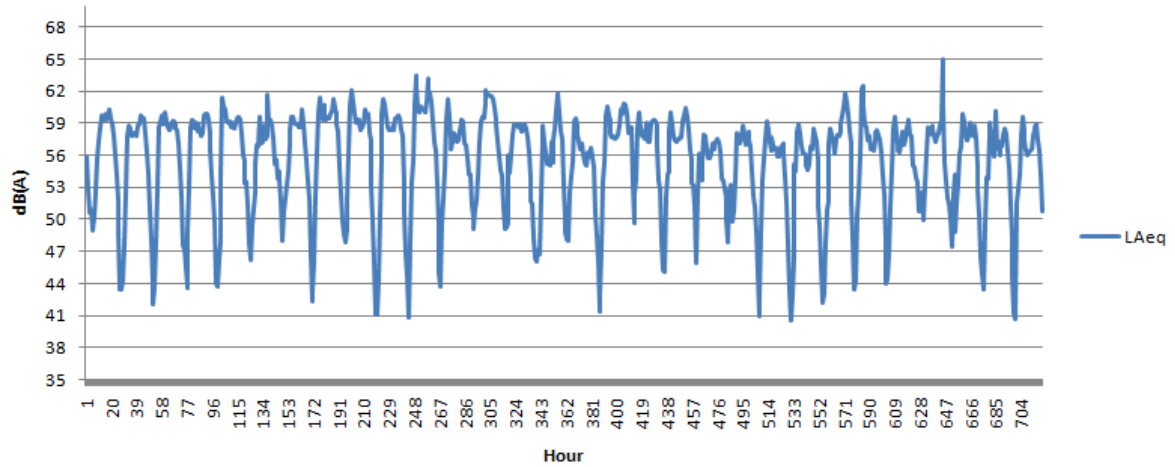
RAHENY LIBRARY
HOWTH ROAD
DUBLIN 5



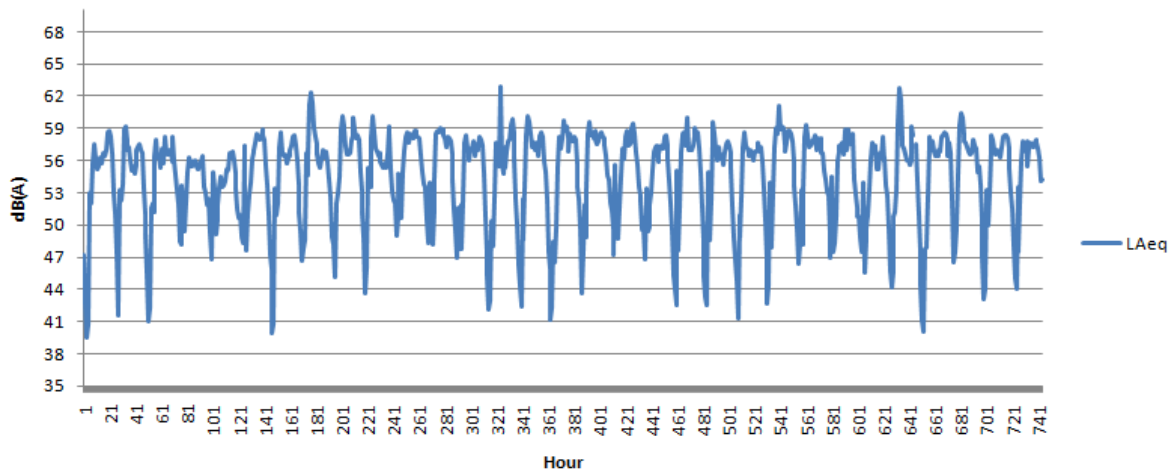




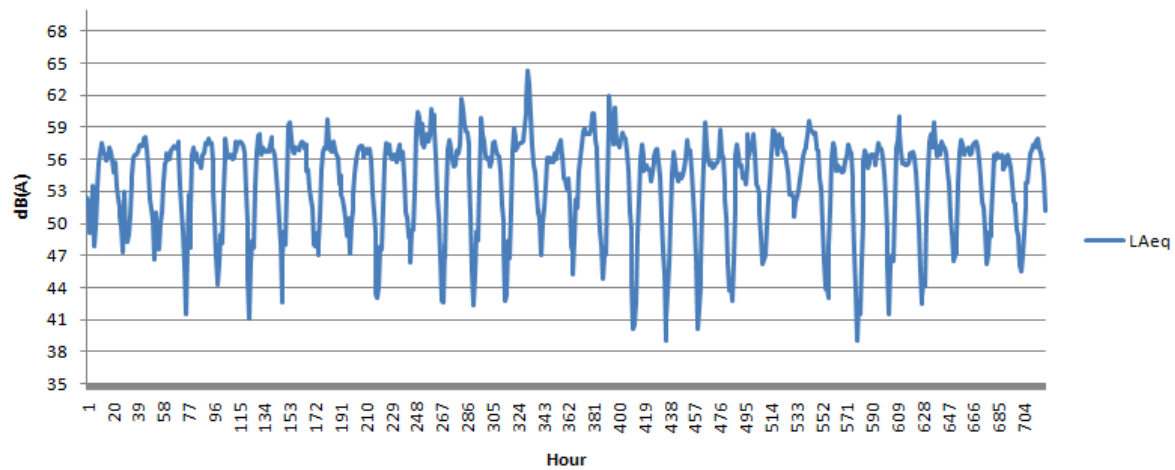
Raheny April '13' Hourly Values

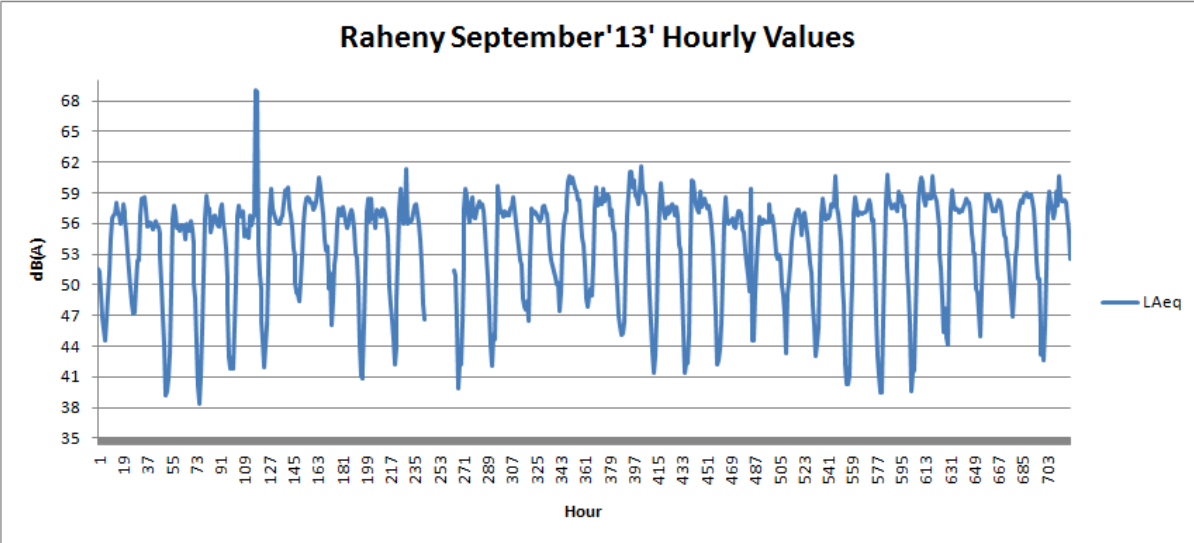
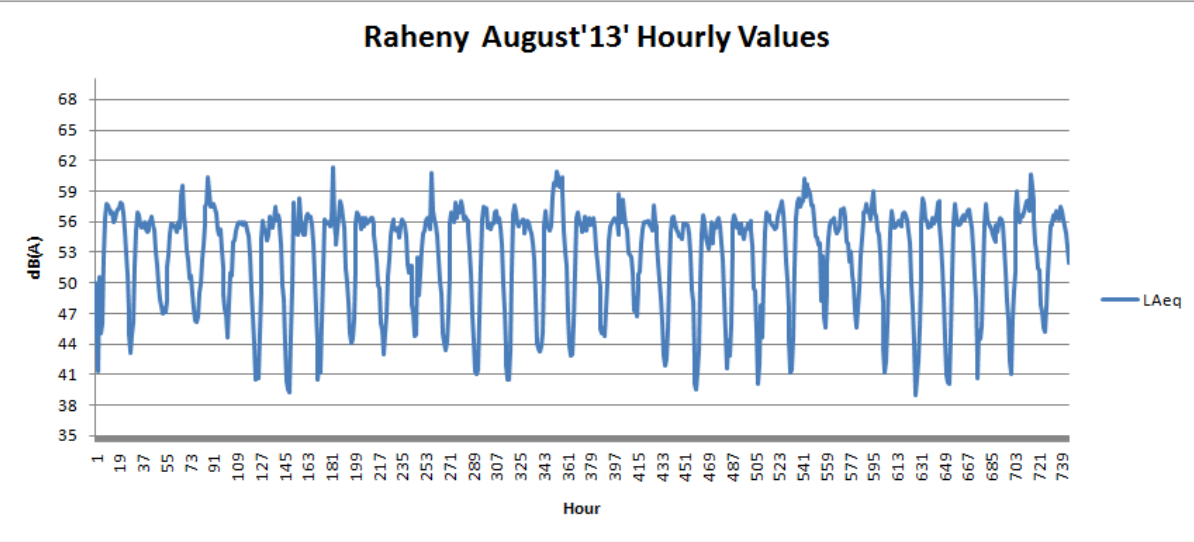
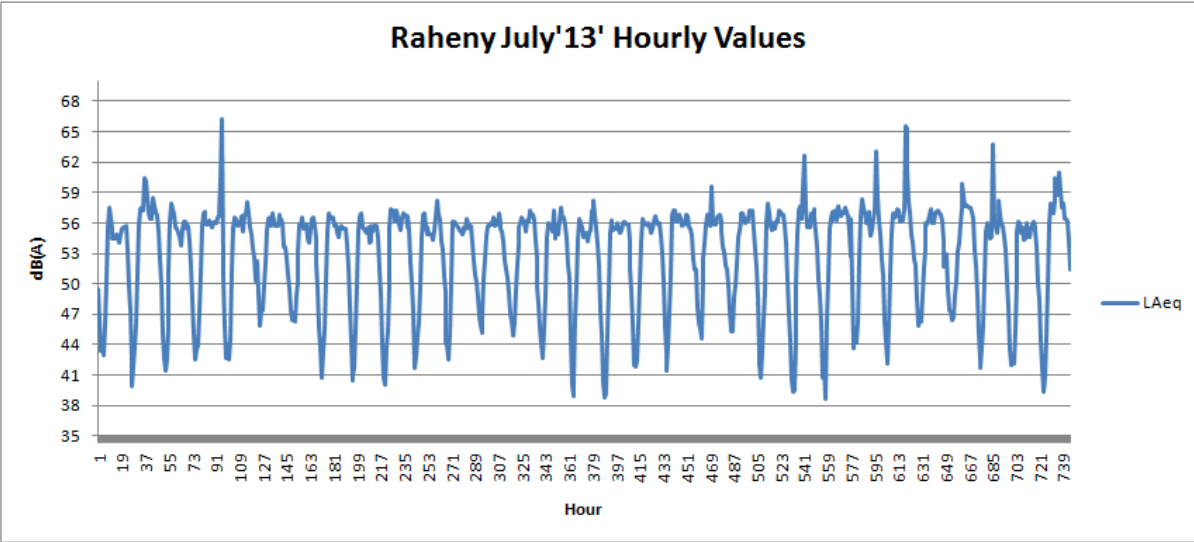


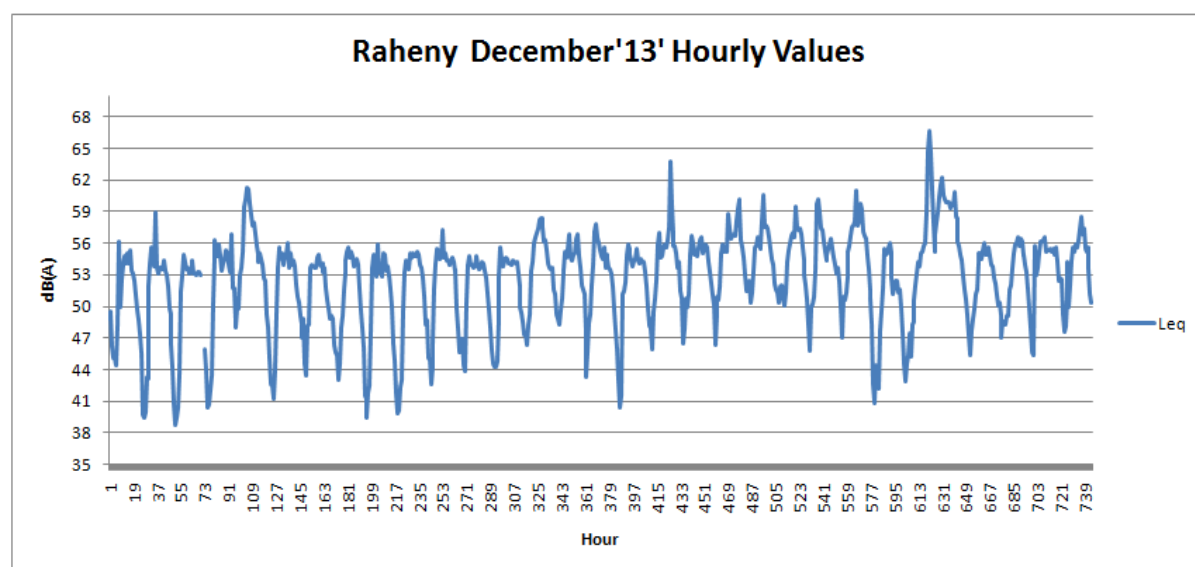
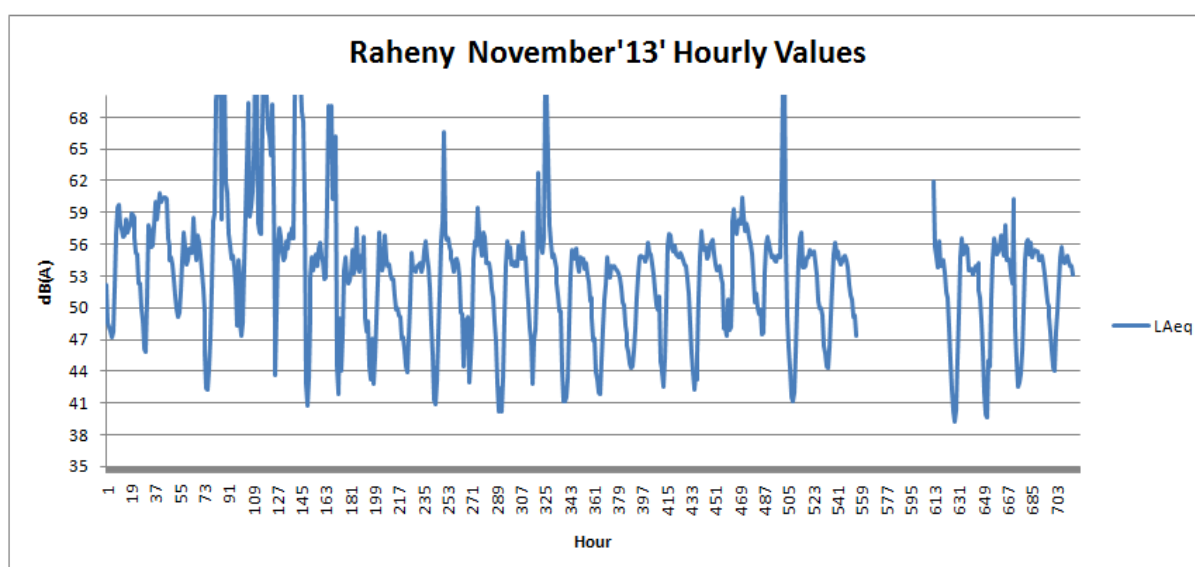
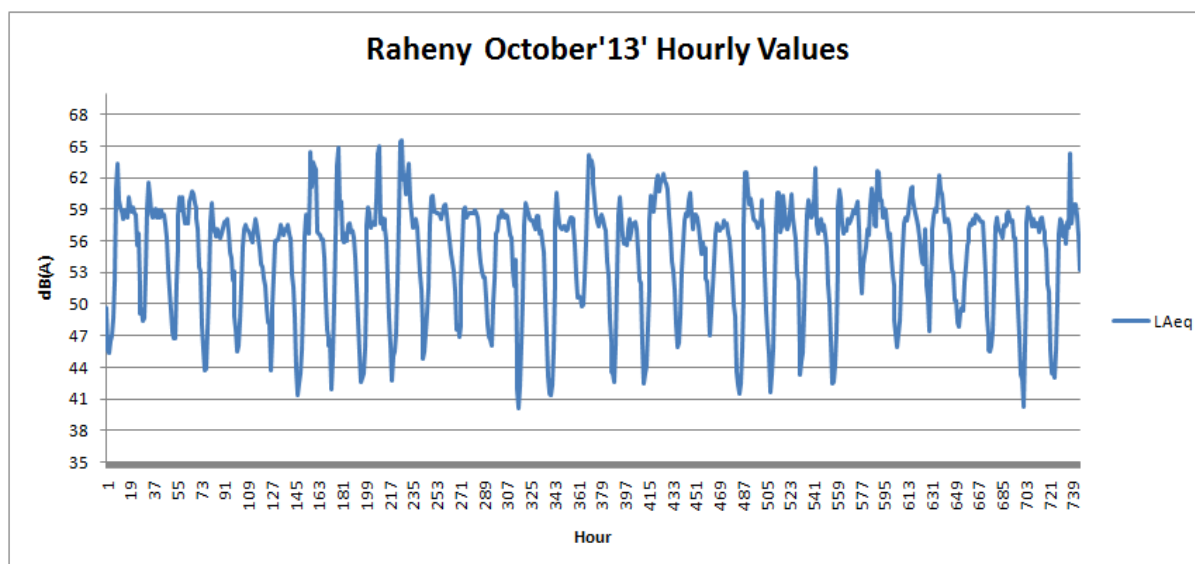
Raheny May '13' Hourly Values



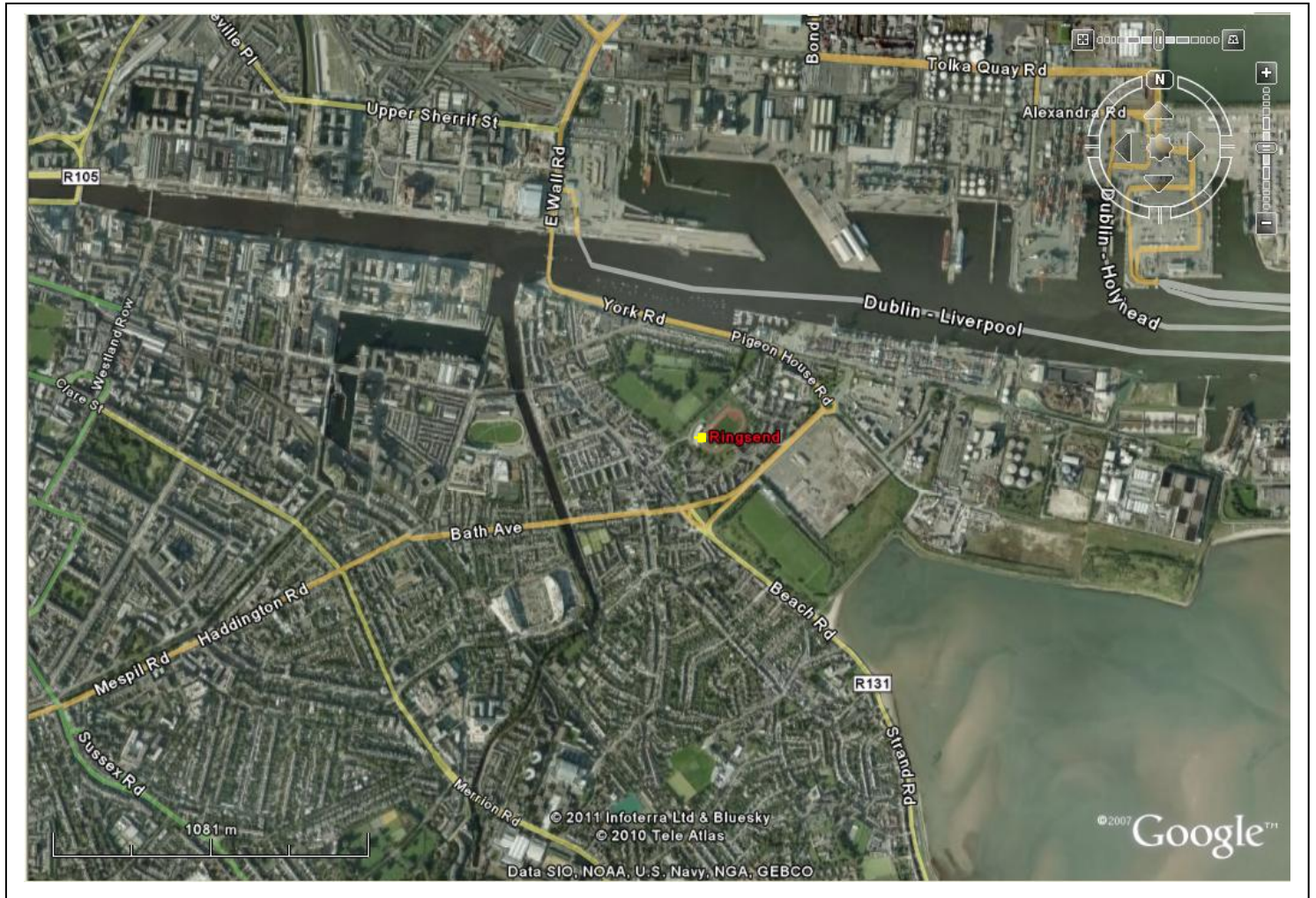
Raheny June '13' Hourly Values



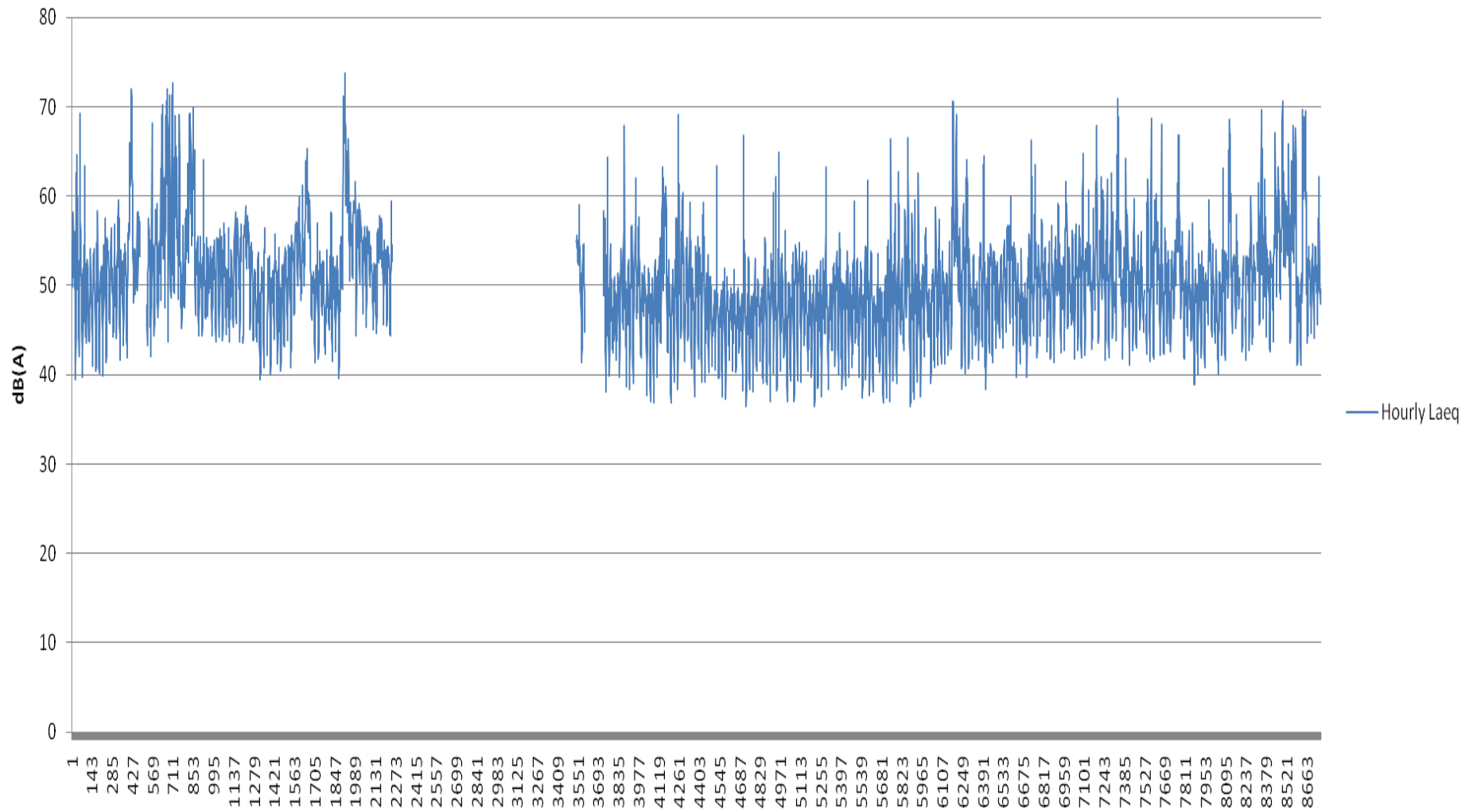


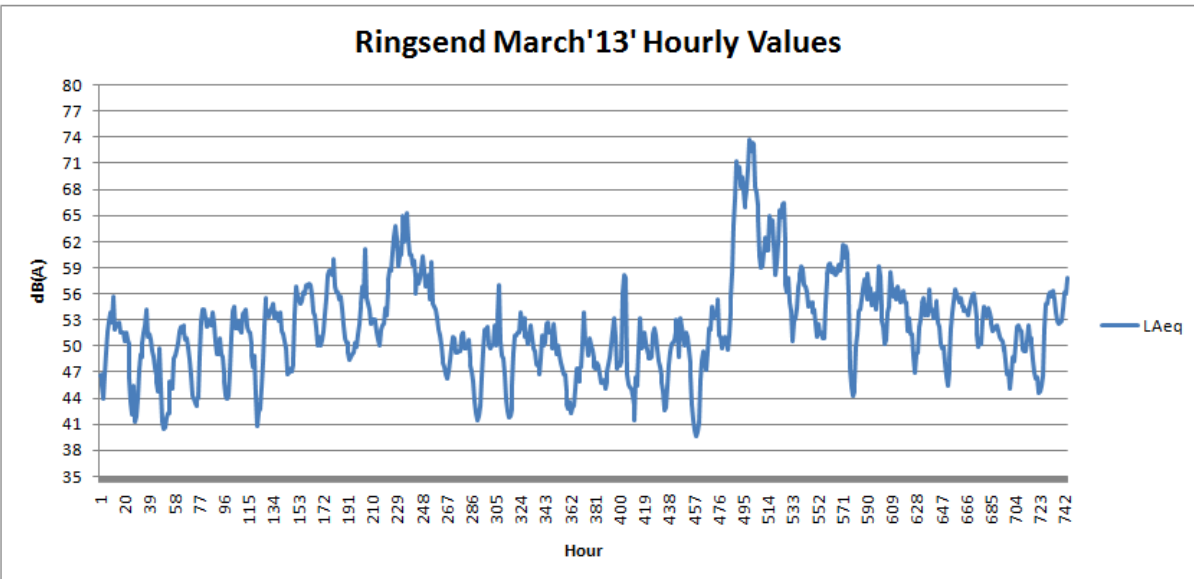
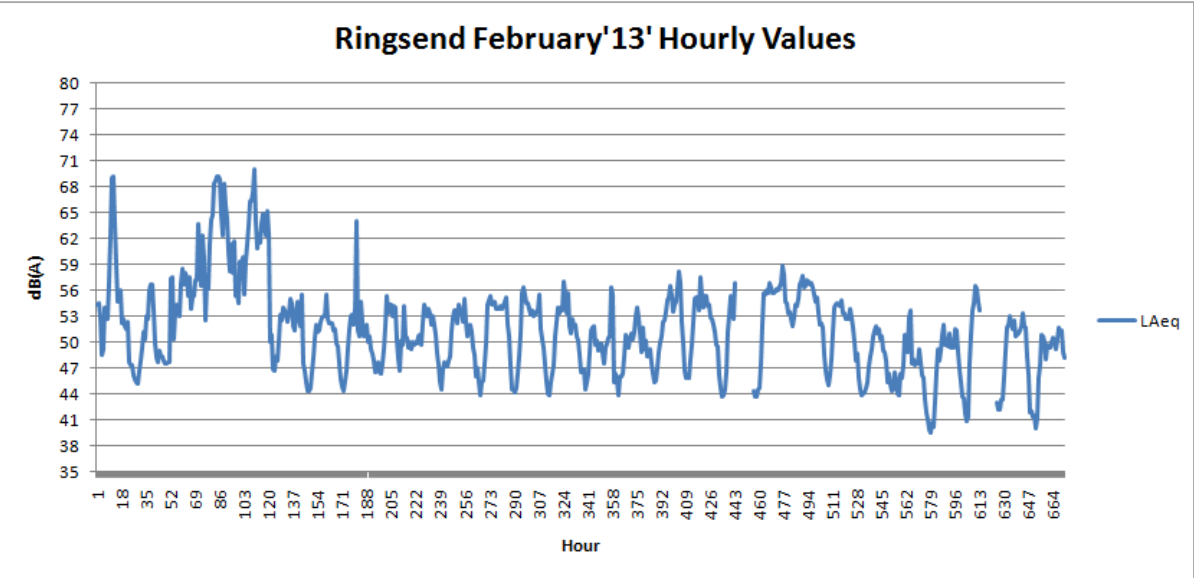
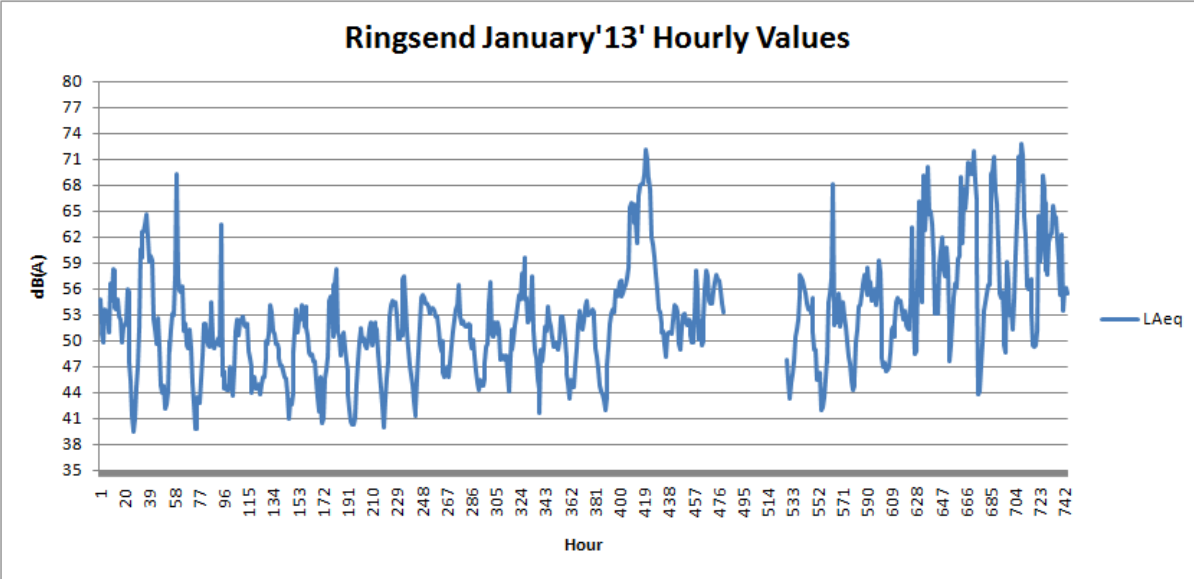


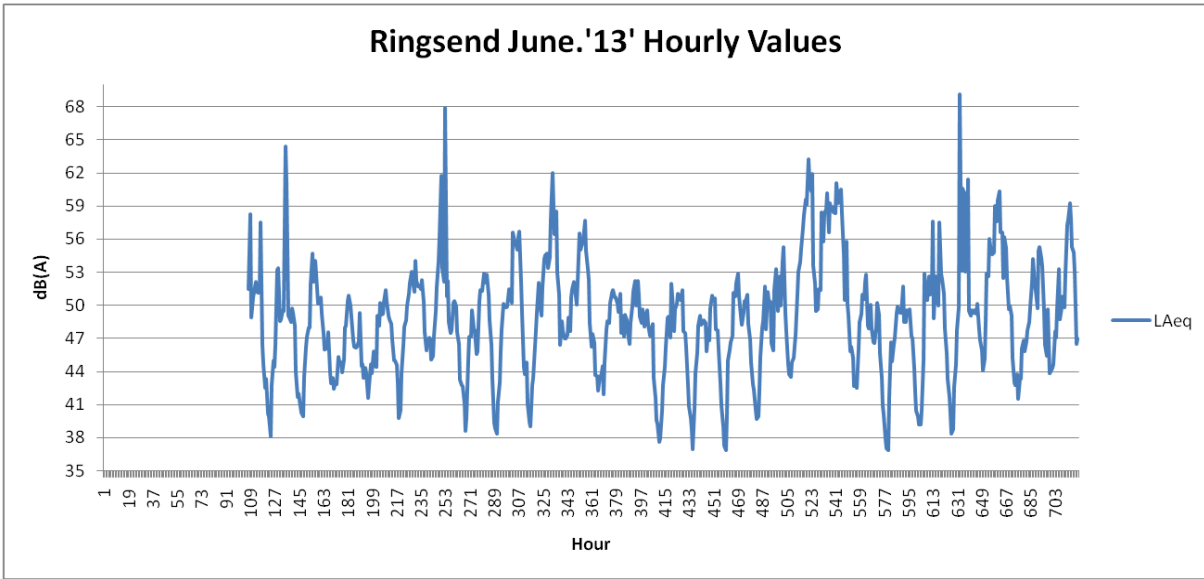
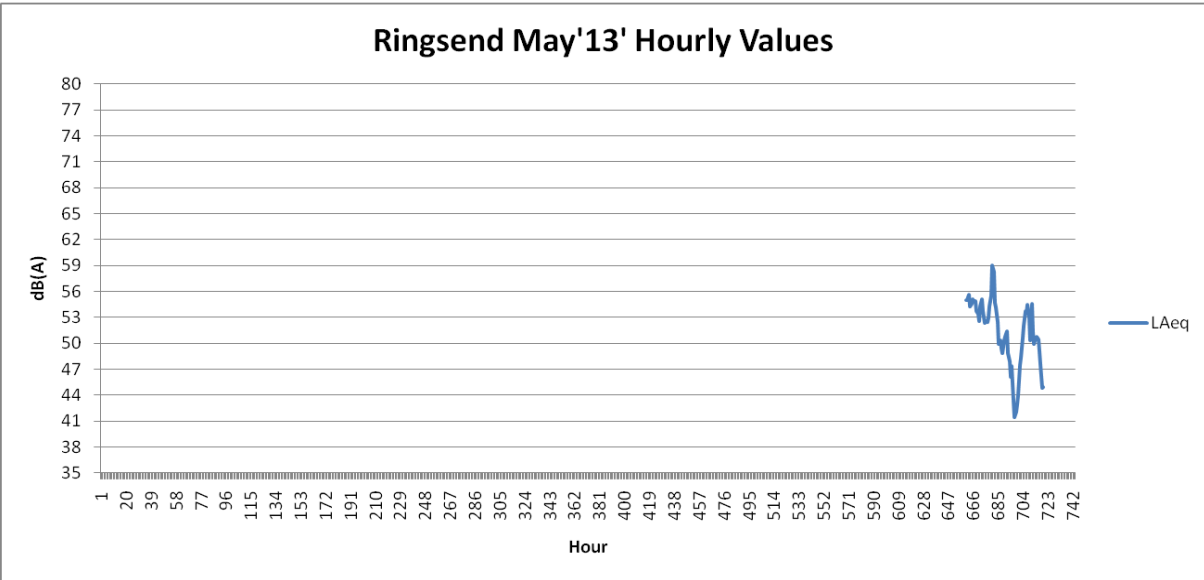
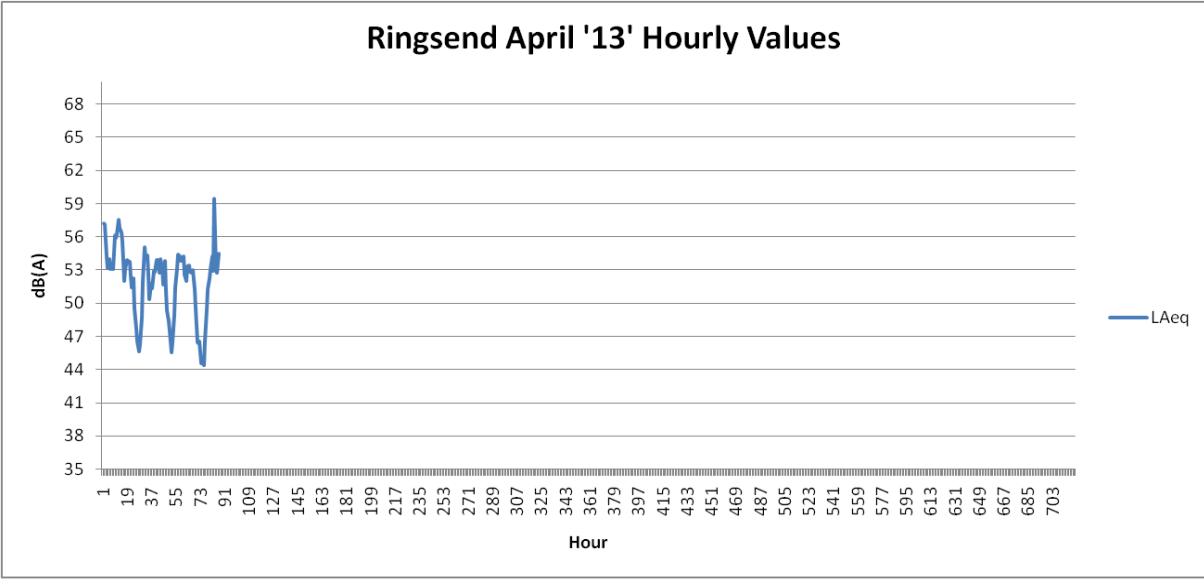
**IRISHTOWN SPORTS CENTRE
RINGSEND
DUBLIN 4**

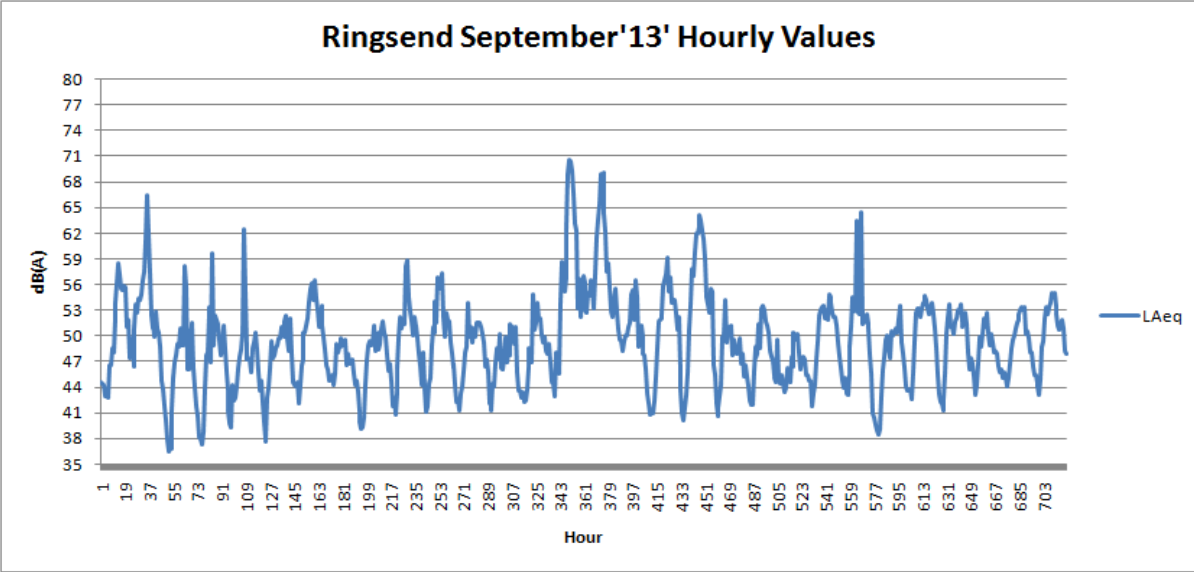
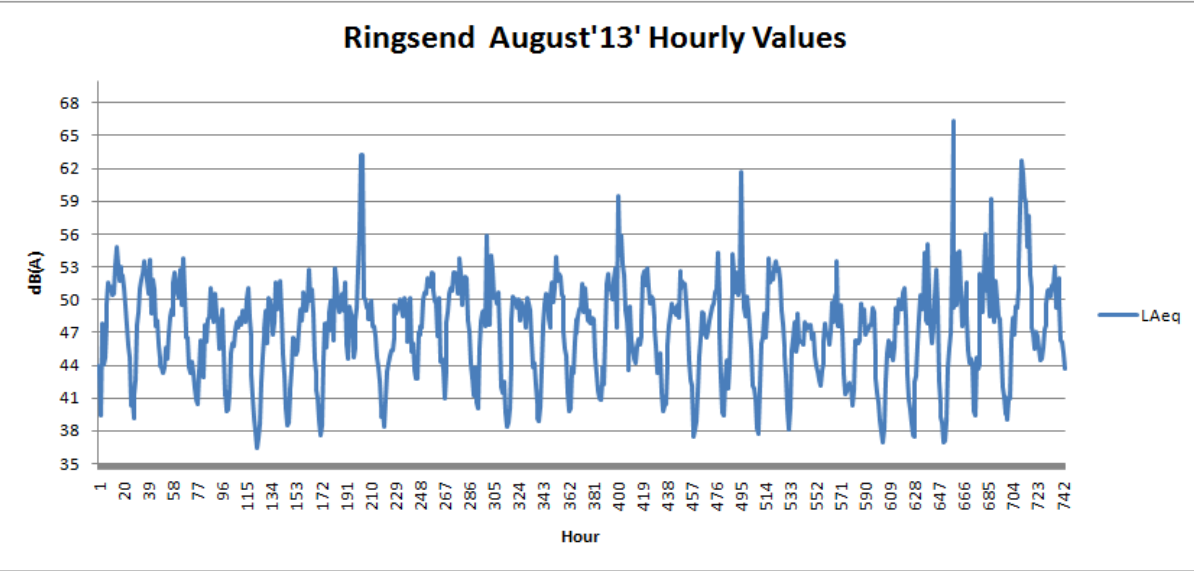
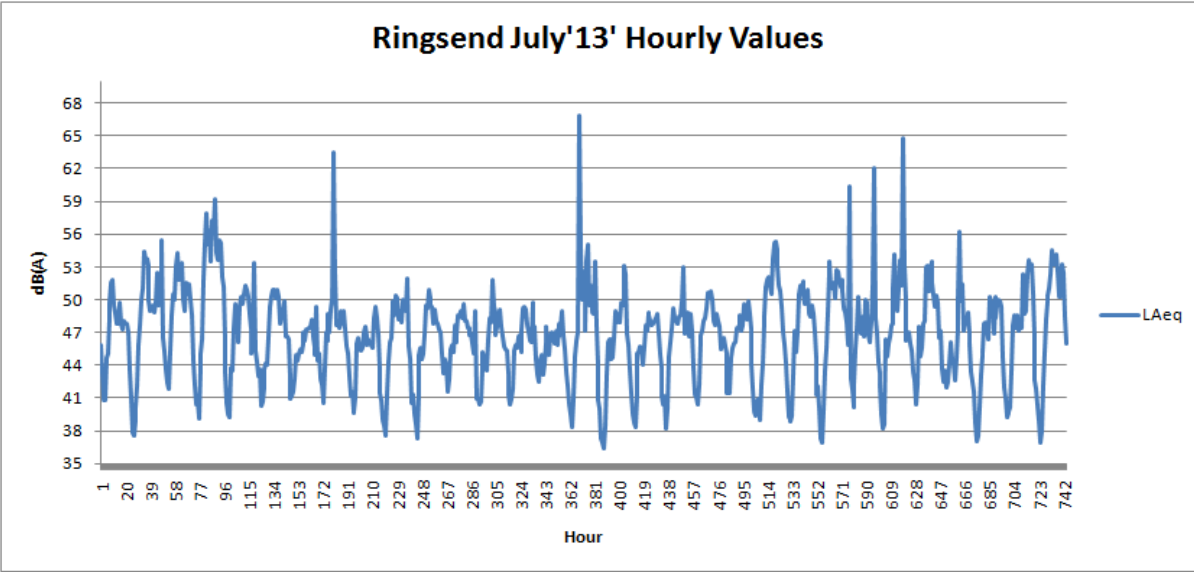


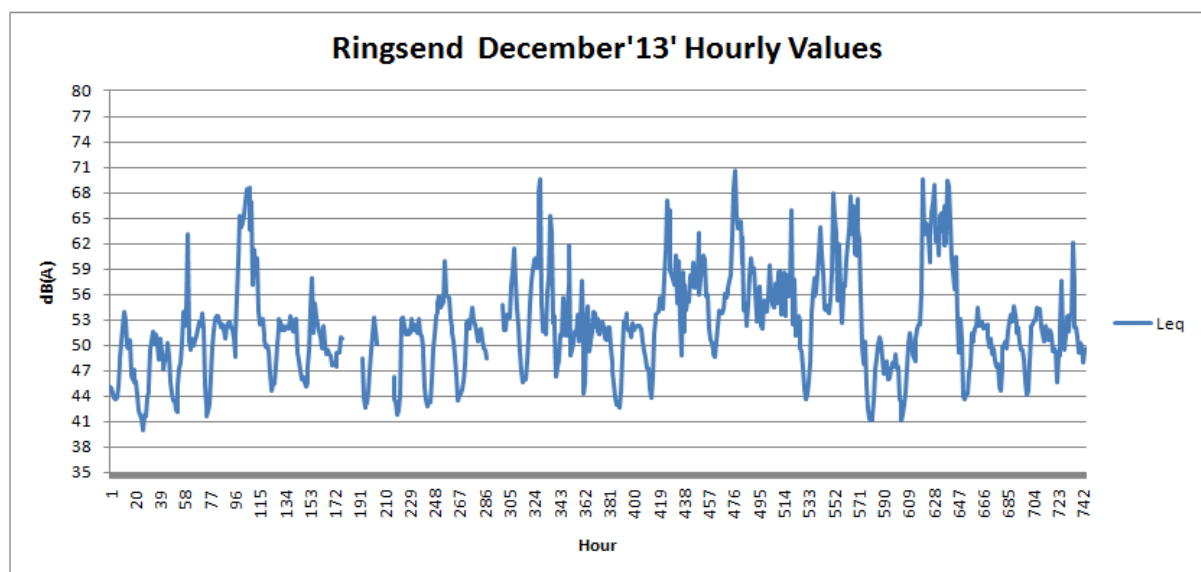
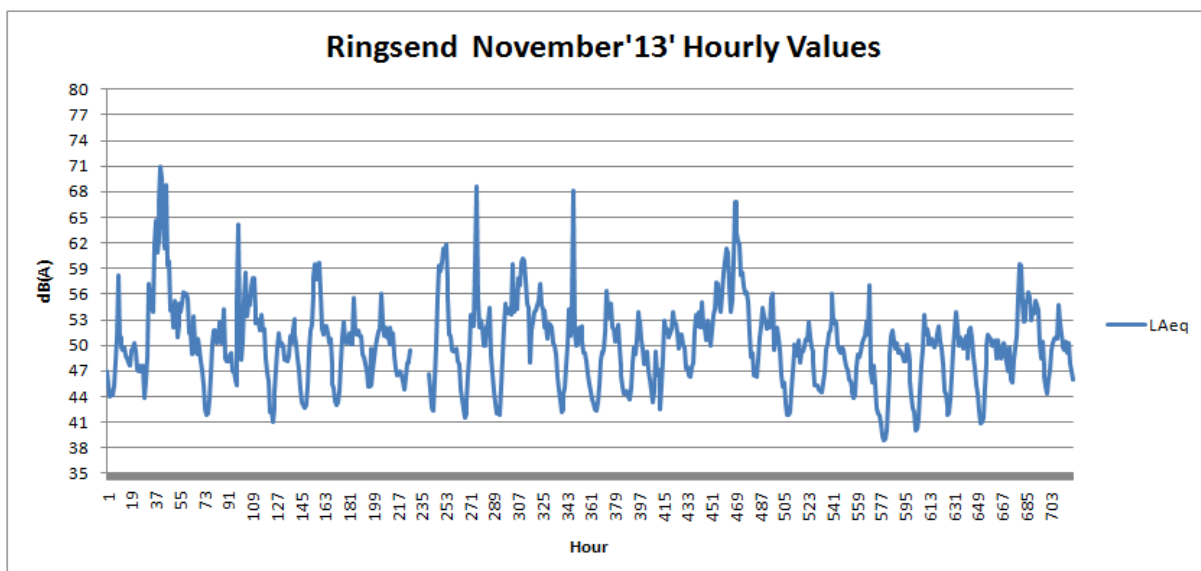
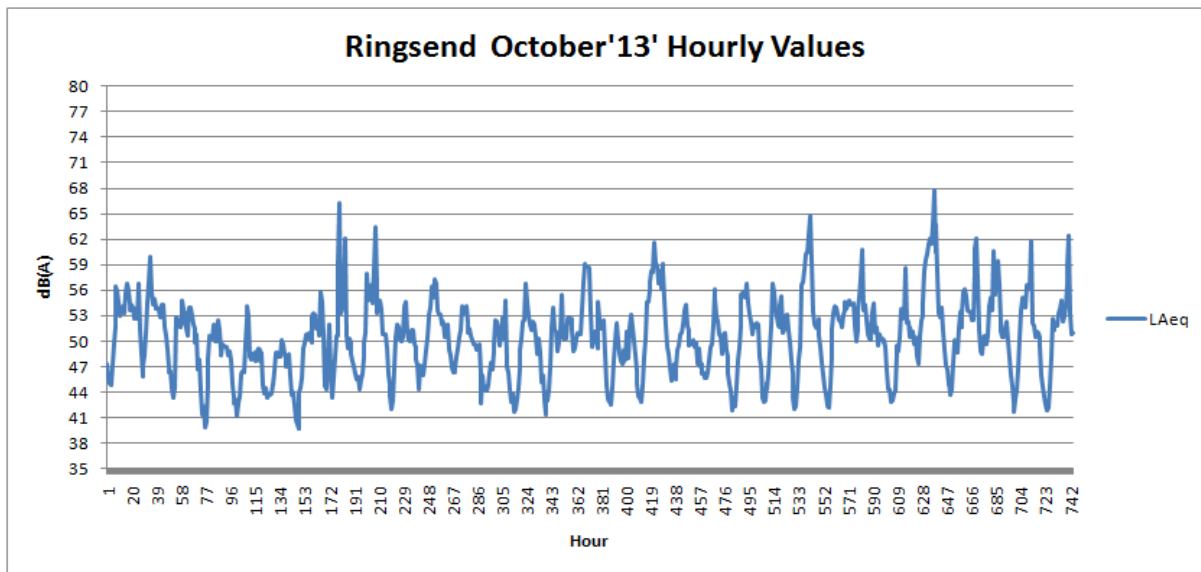
Ringsend Hourly Values - 2013





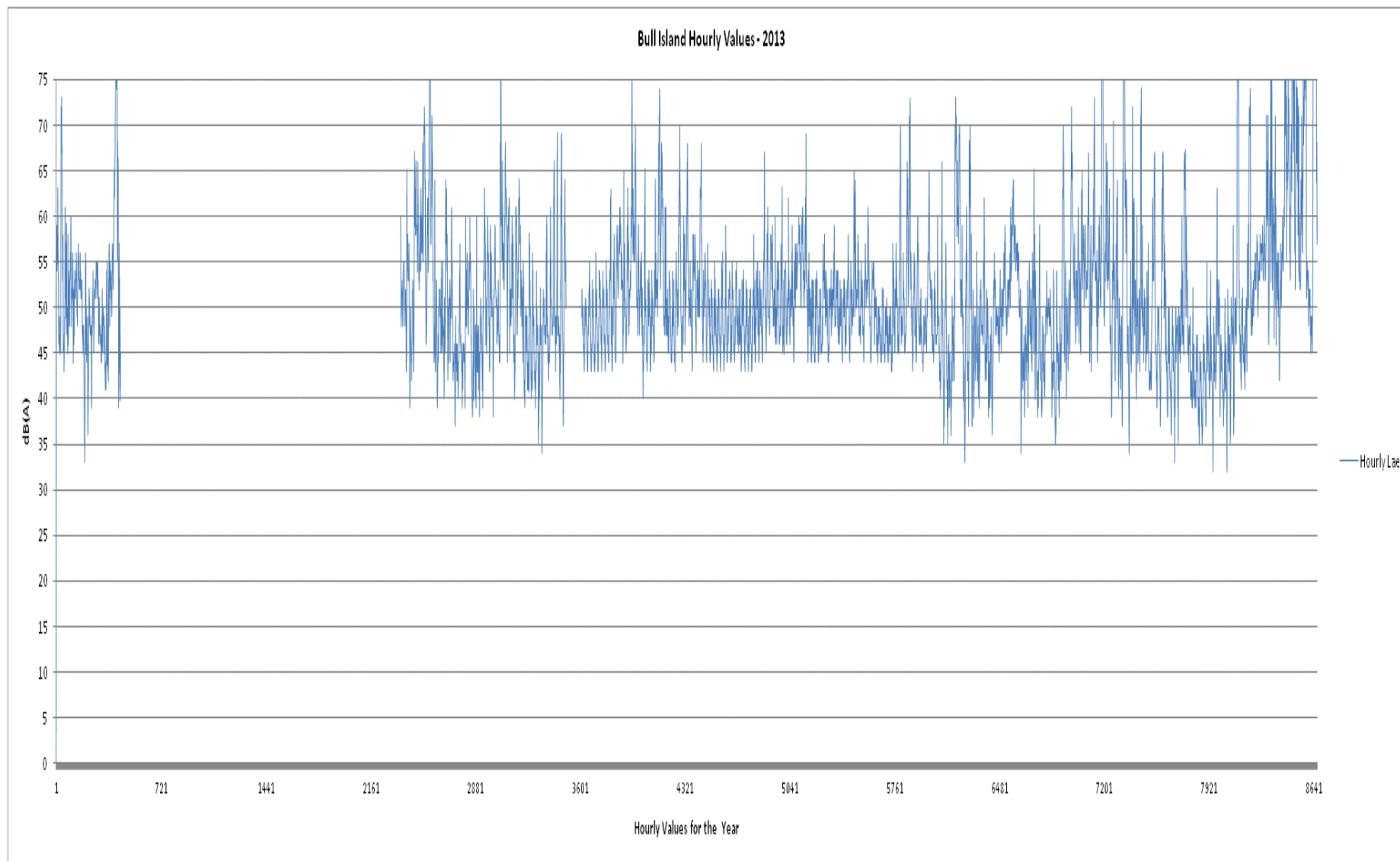


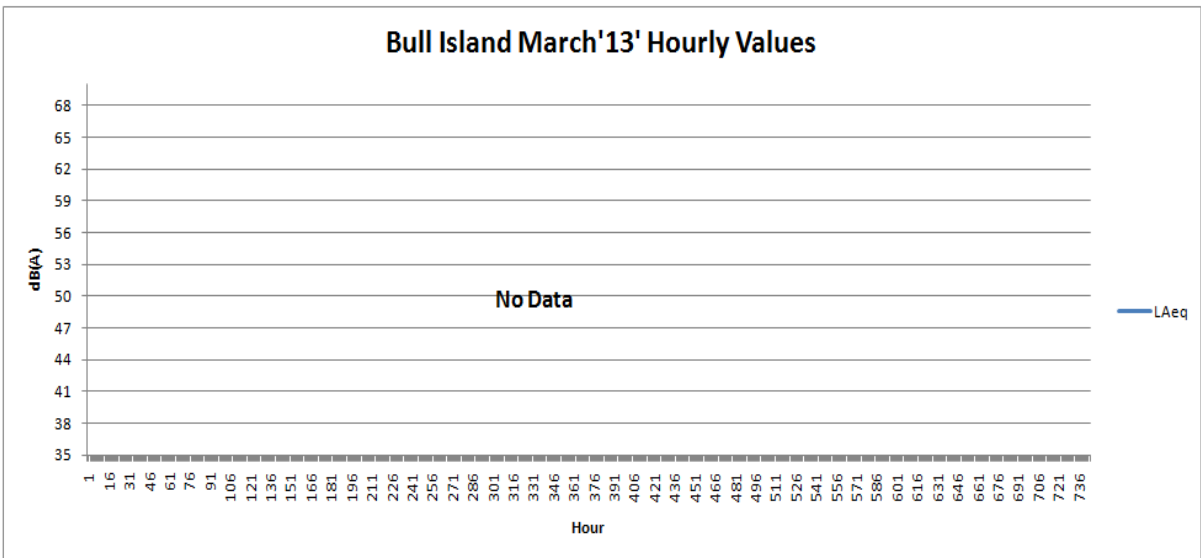
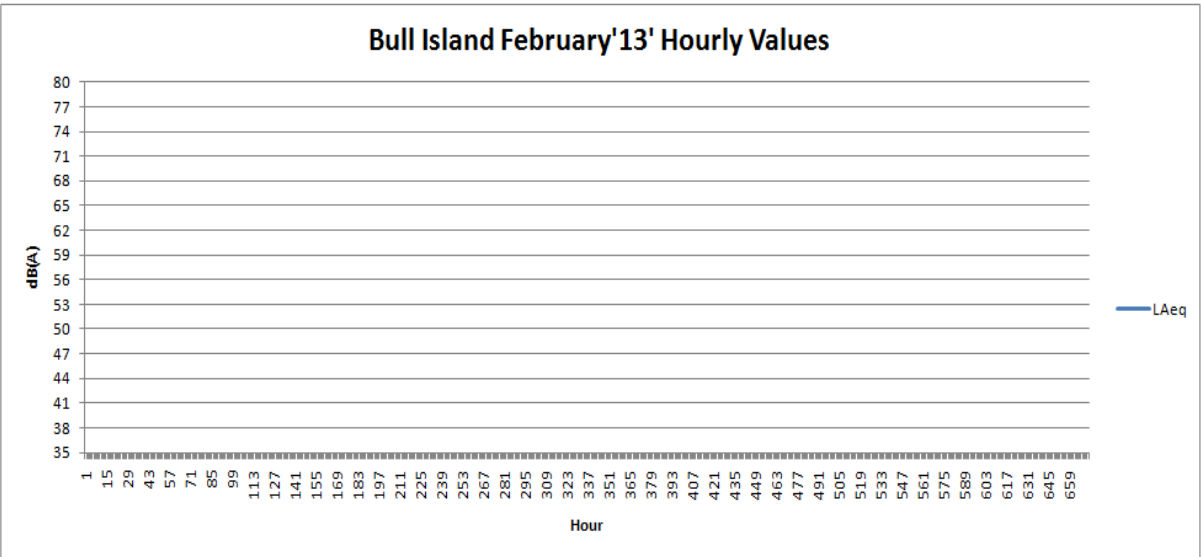
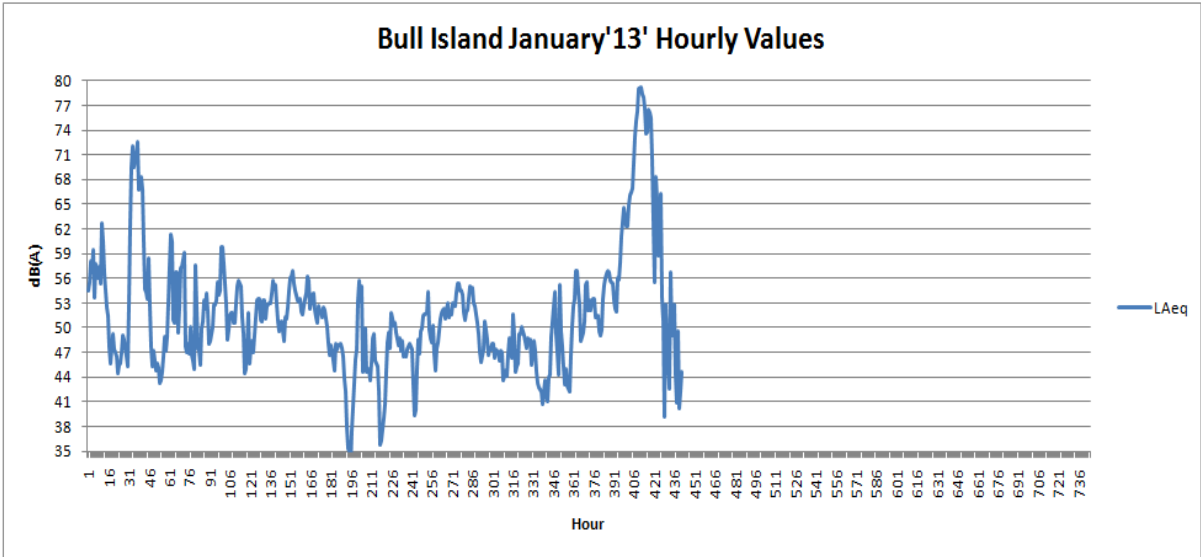


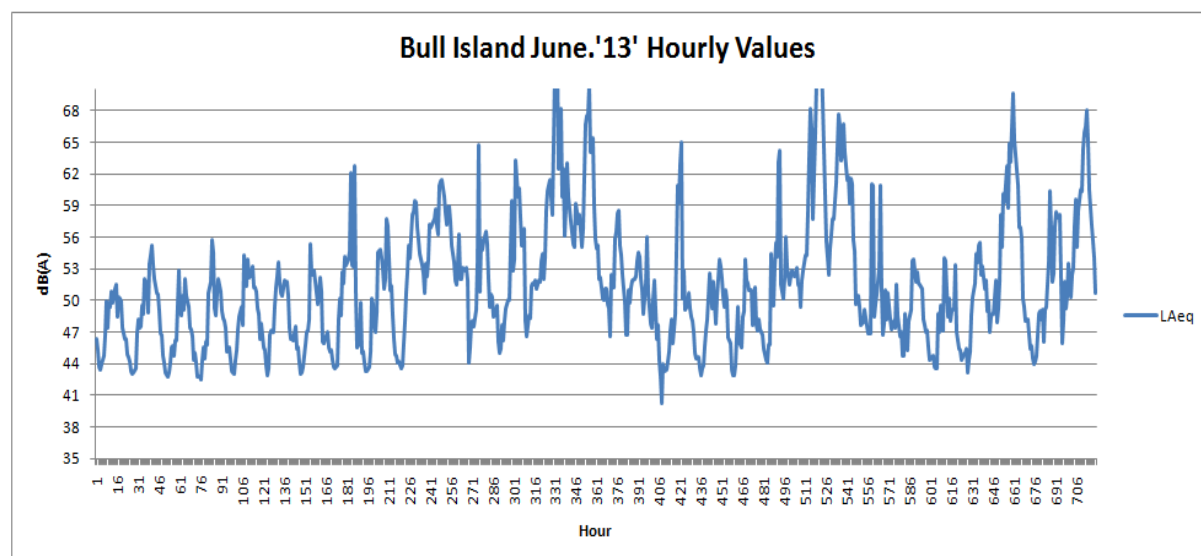
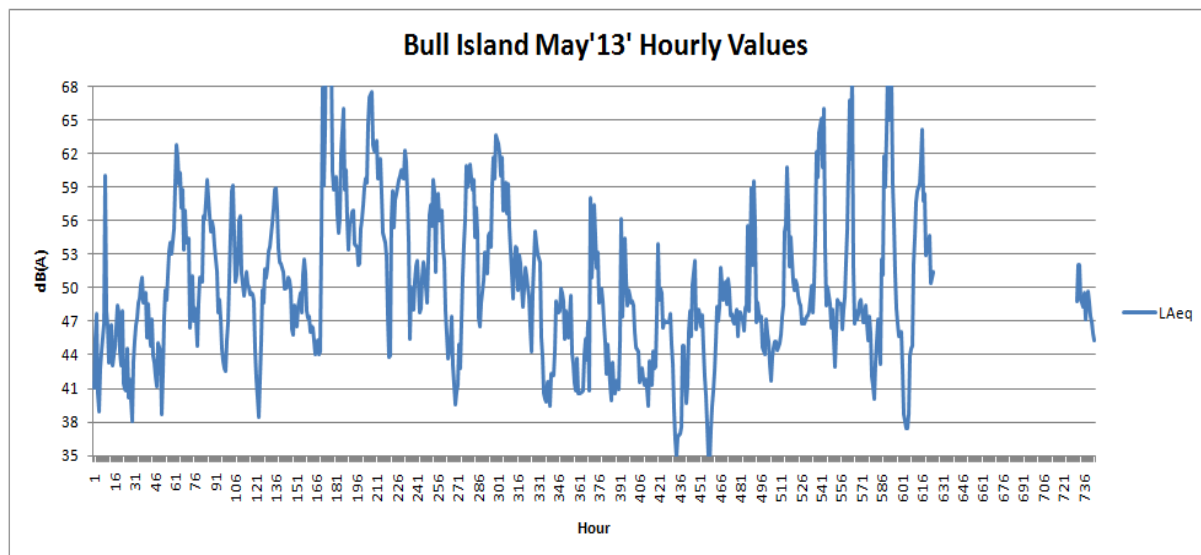
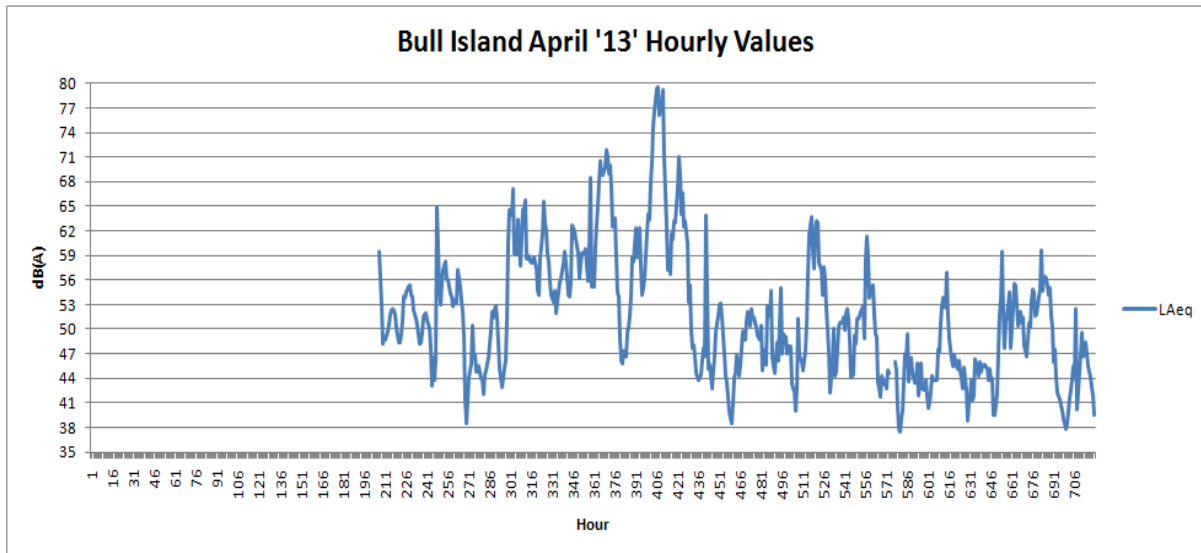


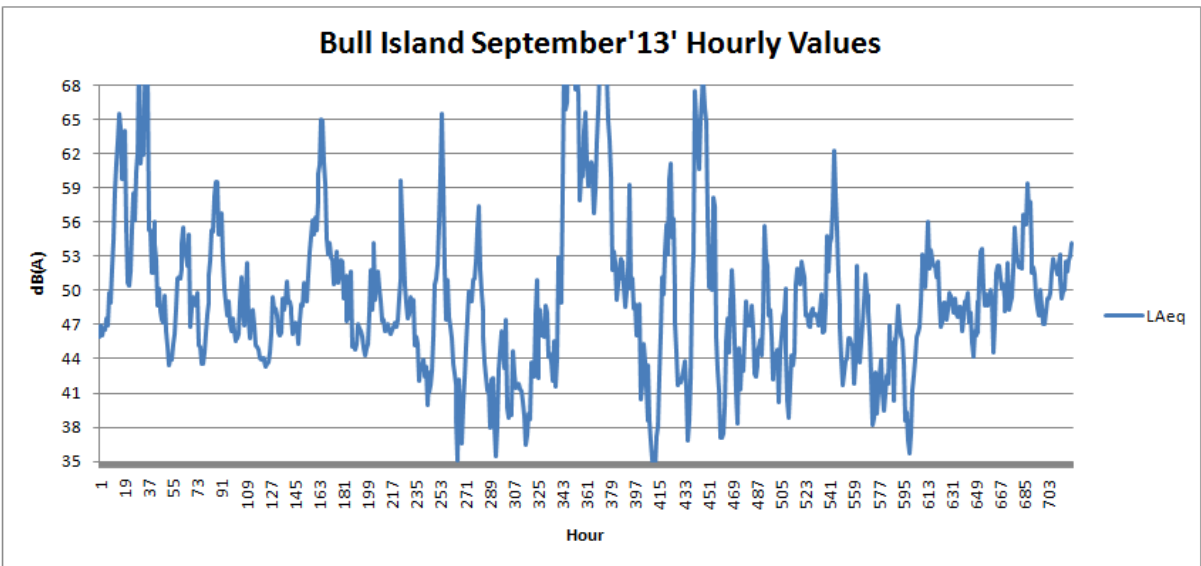
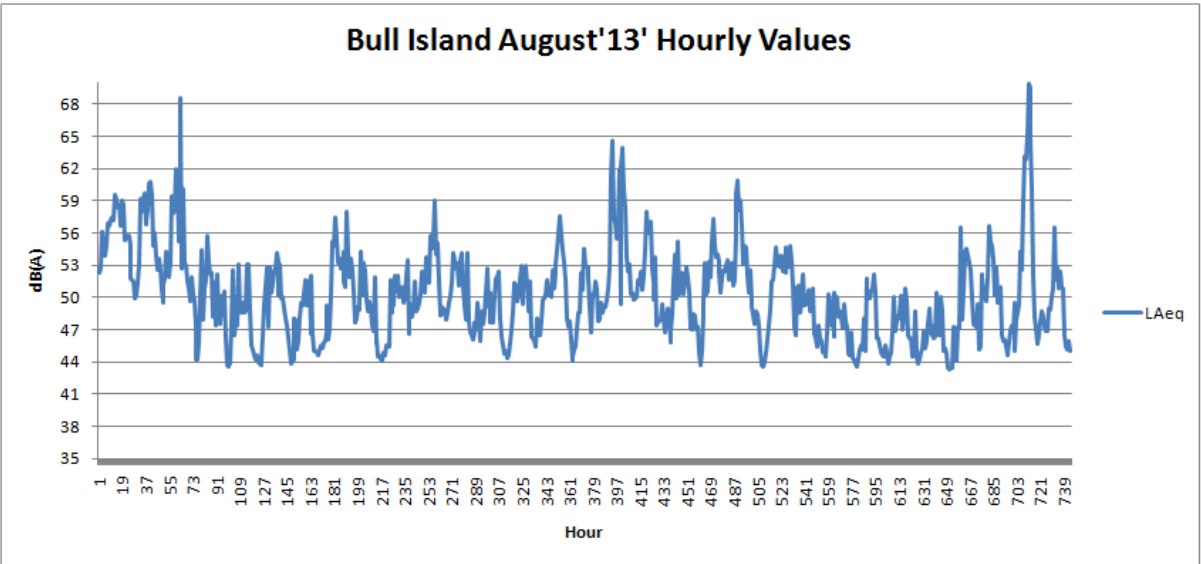
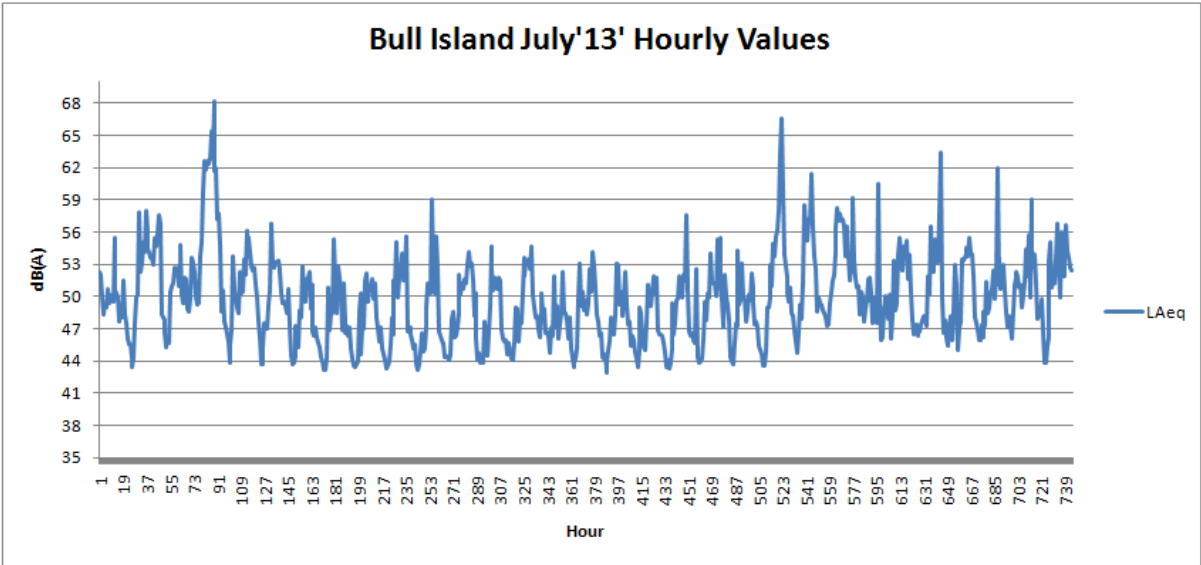
BULL ISLAND INTERPRETATIVE CENTRE
BULL ISLAND
DUBLIN 3

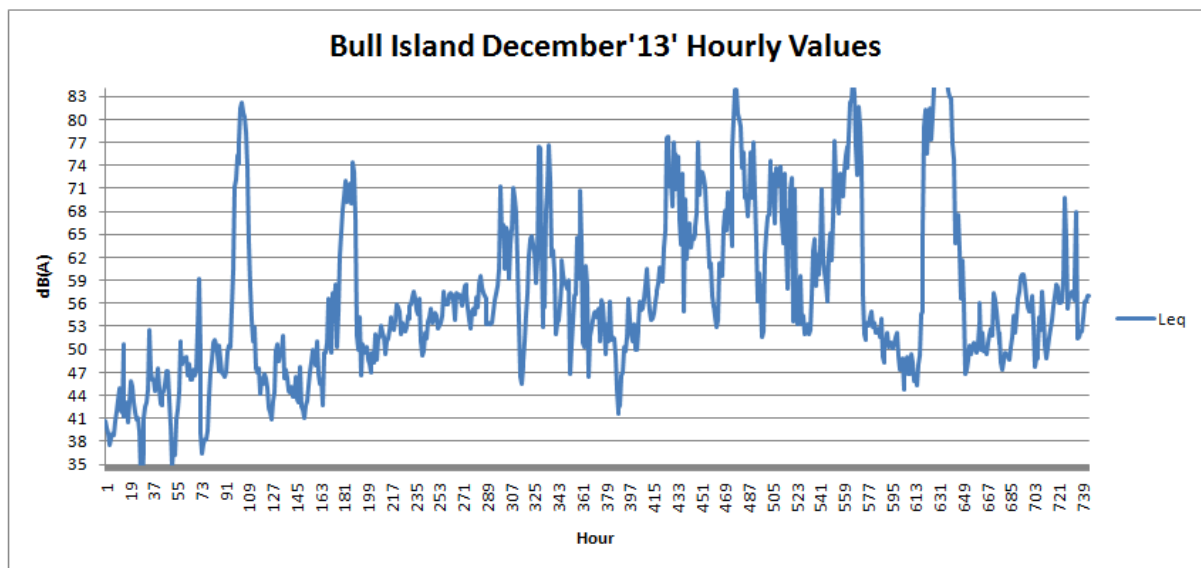
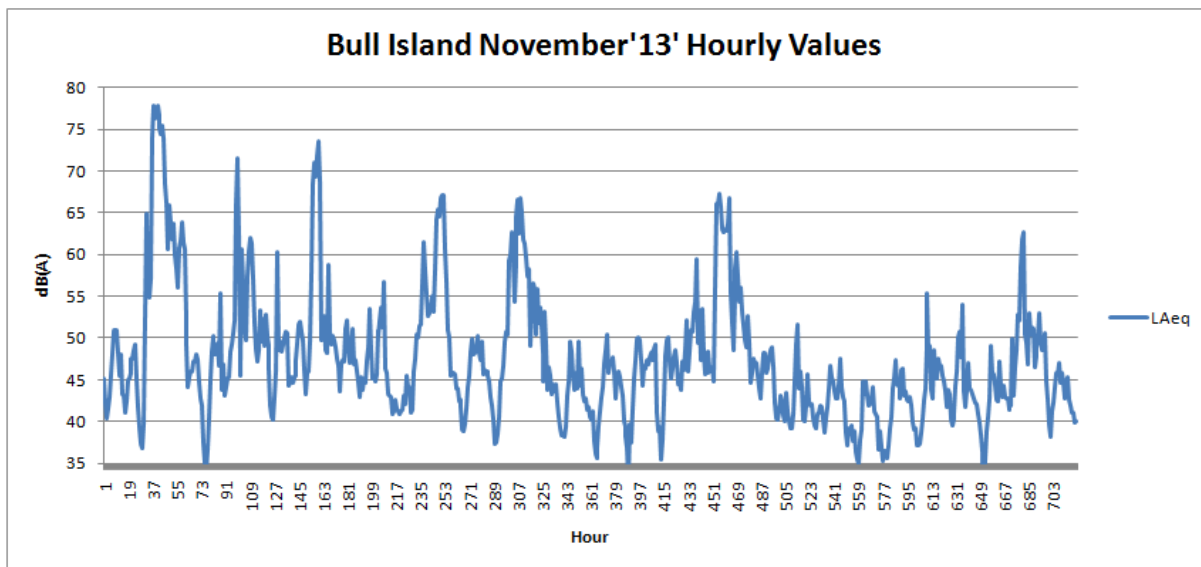
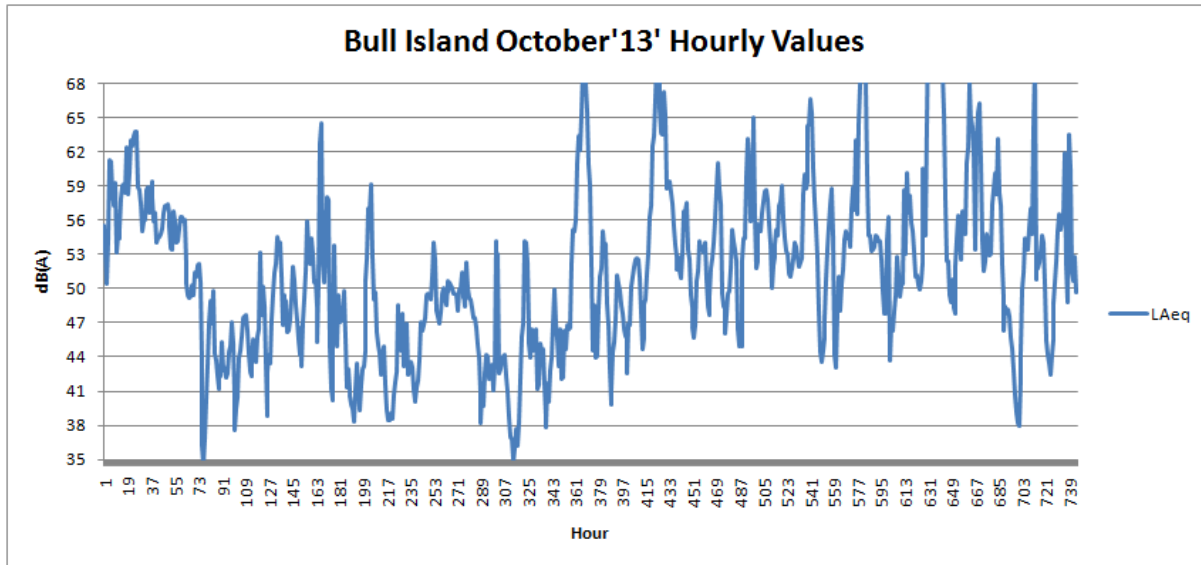






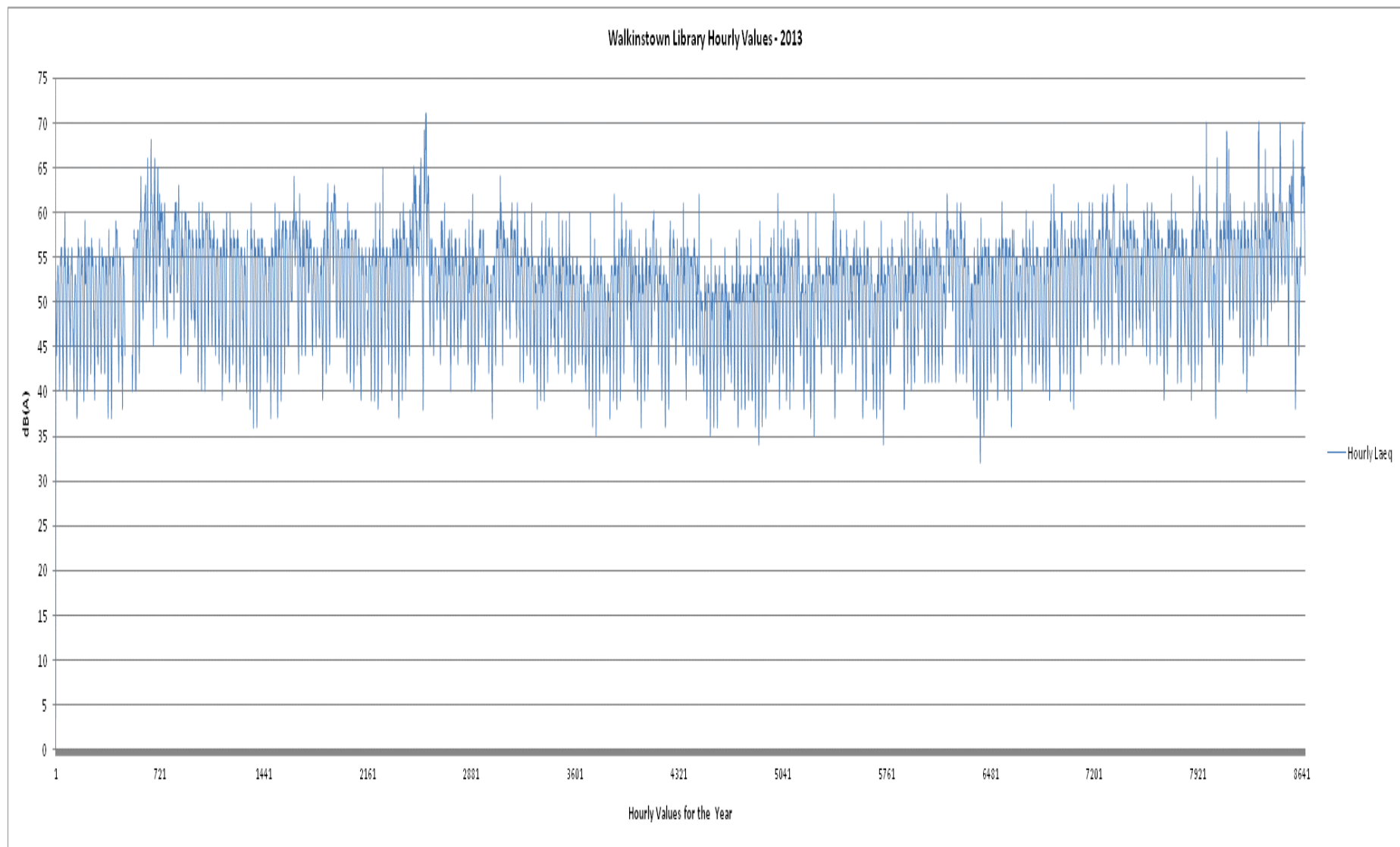


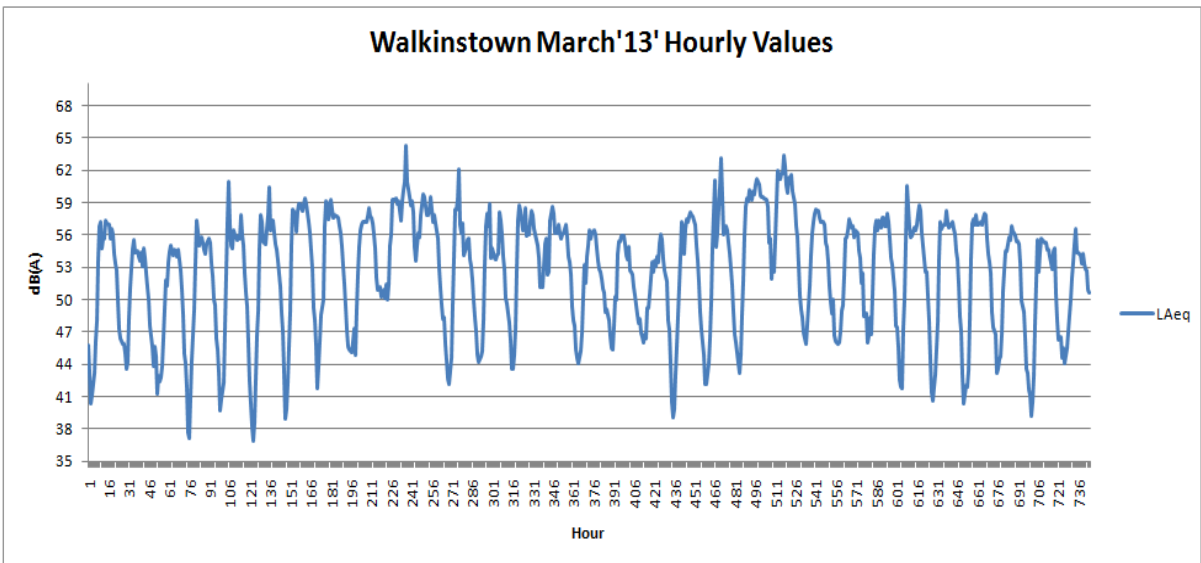
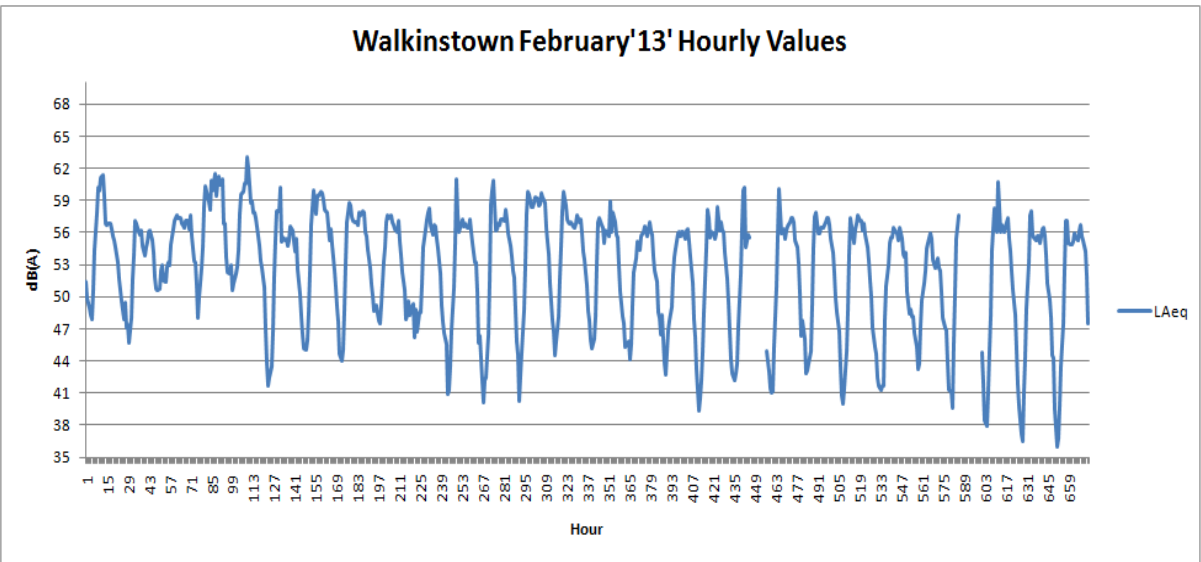
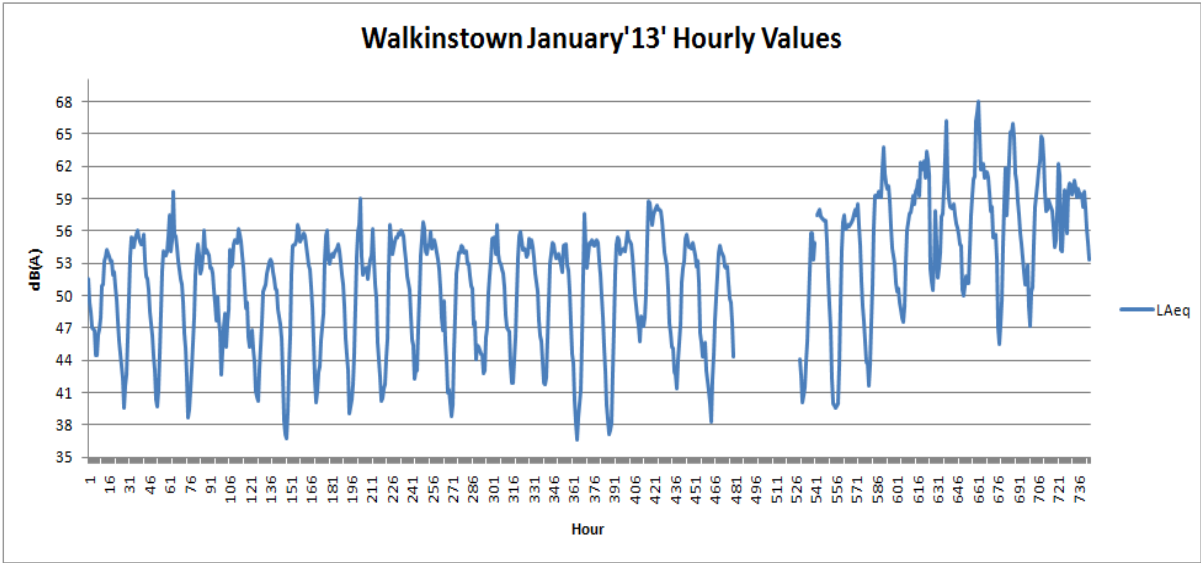


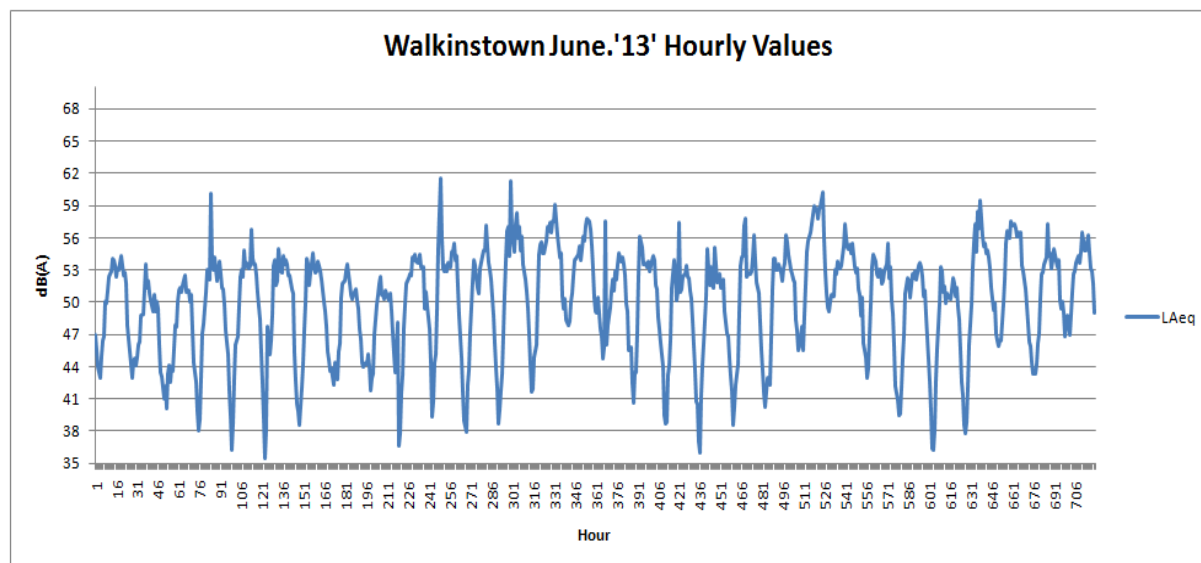
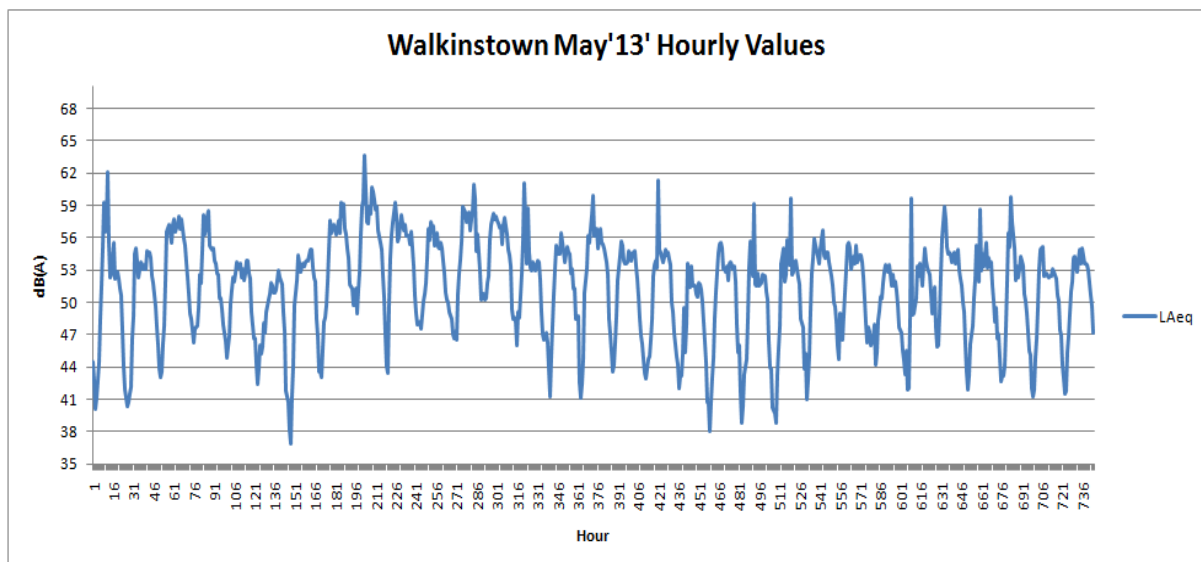
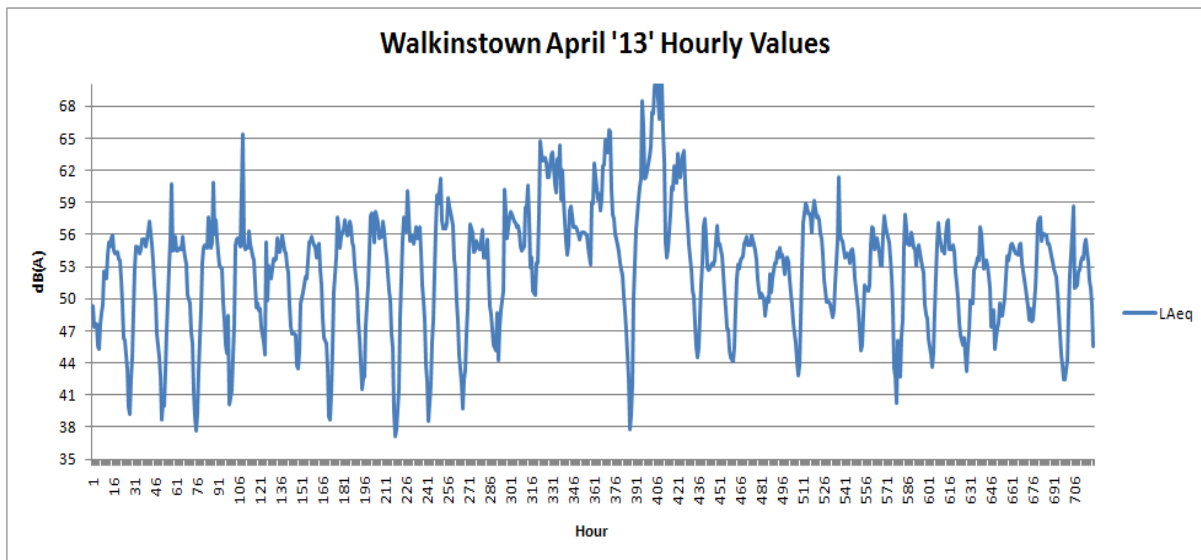


WALKINSTOWN LIBRARY
PERCY FRENCH ROAD
DUBLIN 12

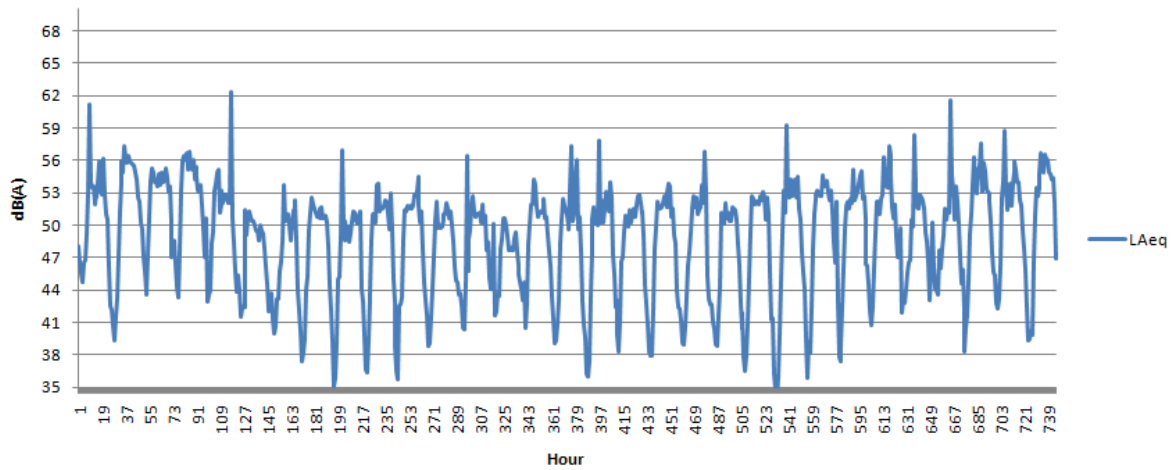




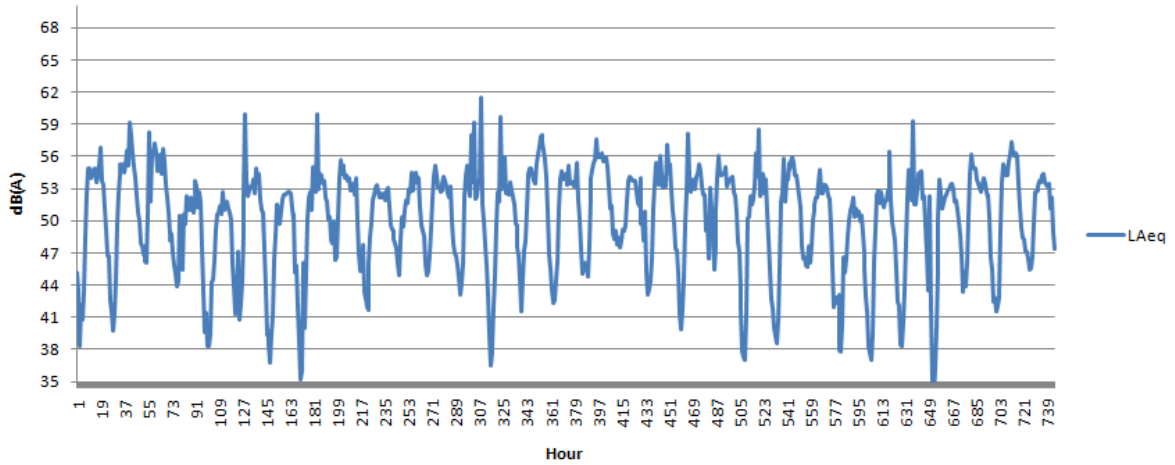




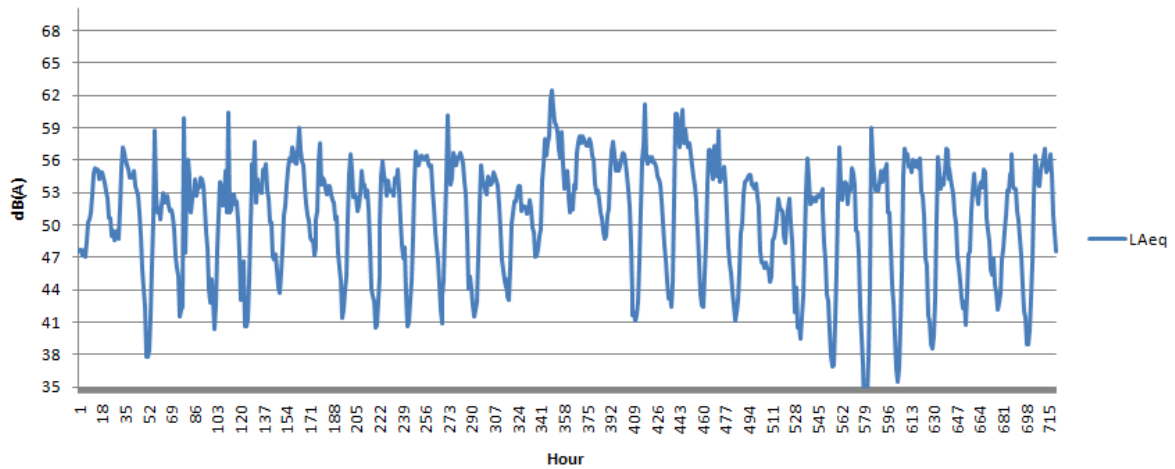
Walkinstown July '13' Hourly Values

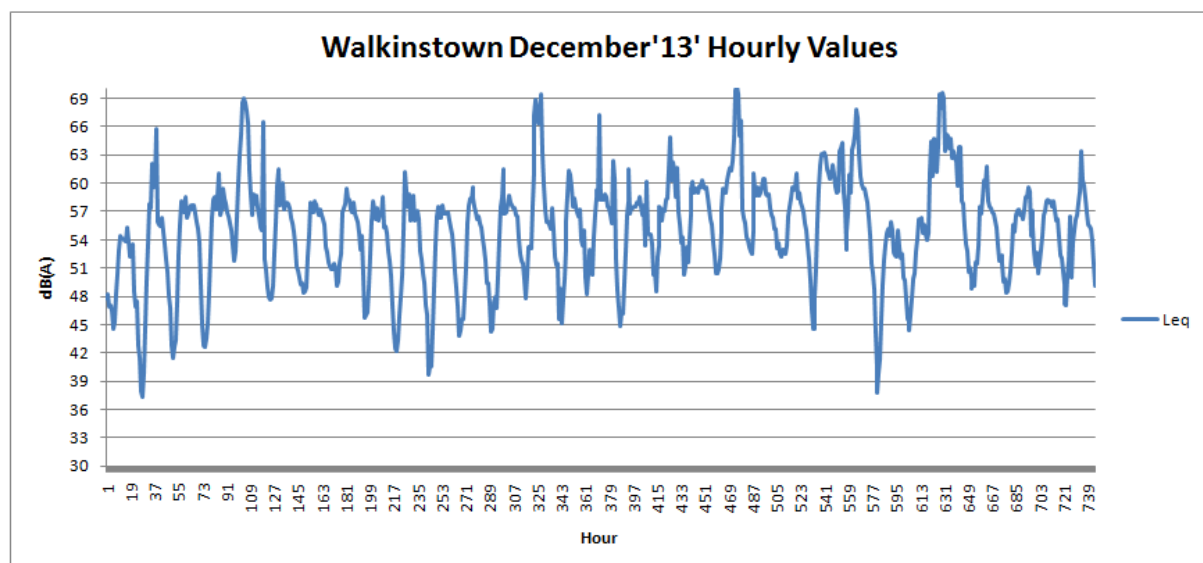
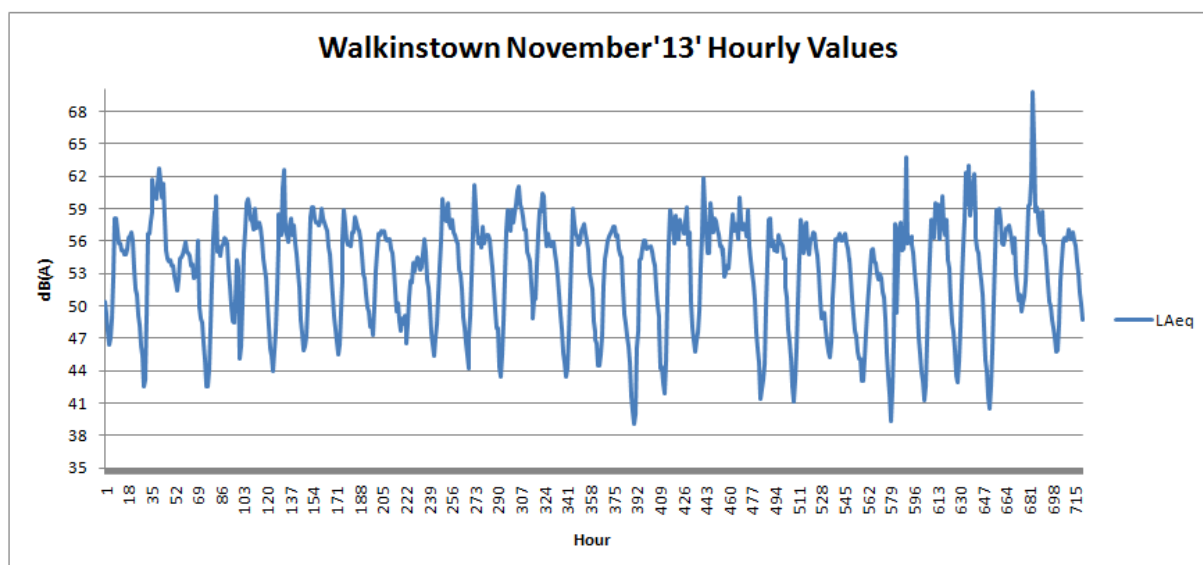
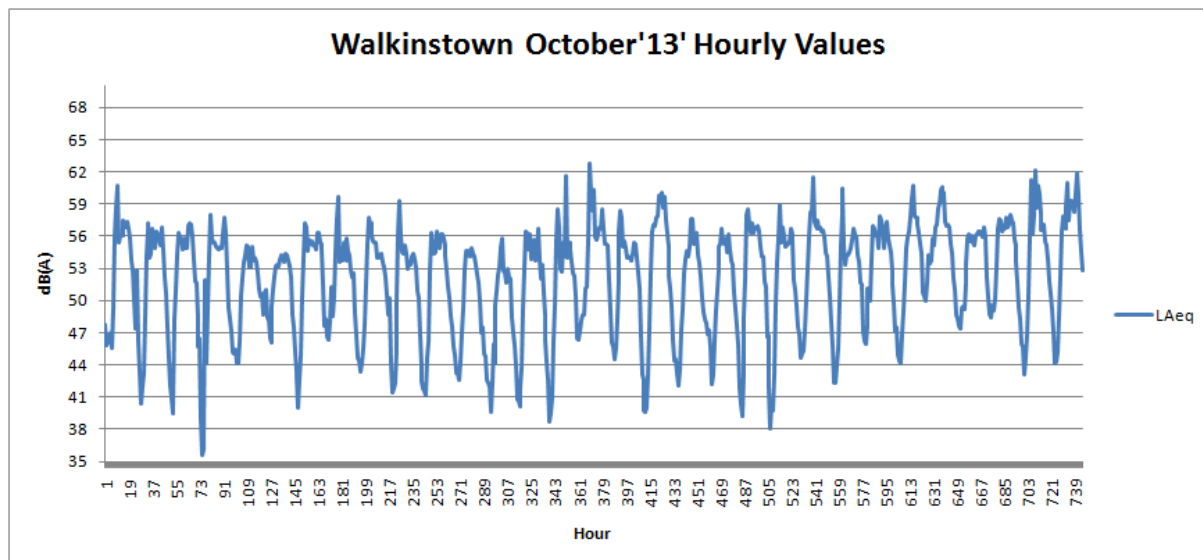


Walkinstown August '13' Hourly Values



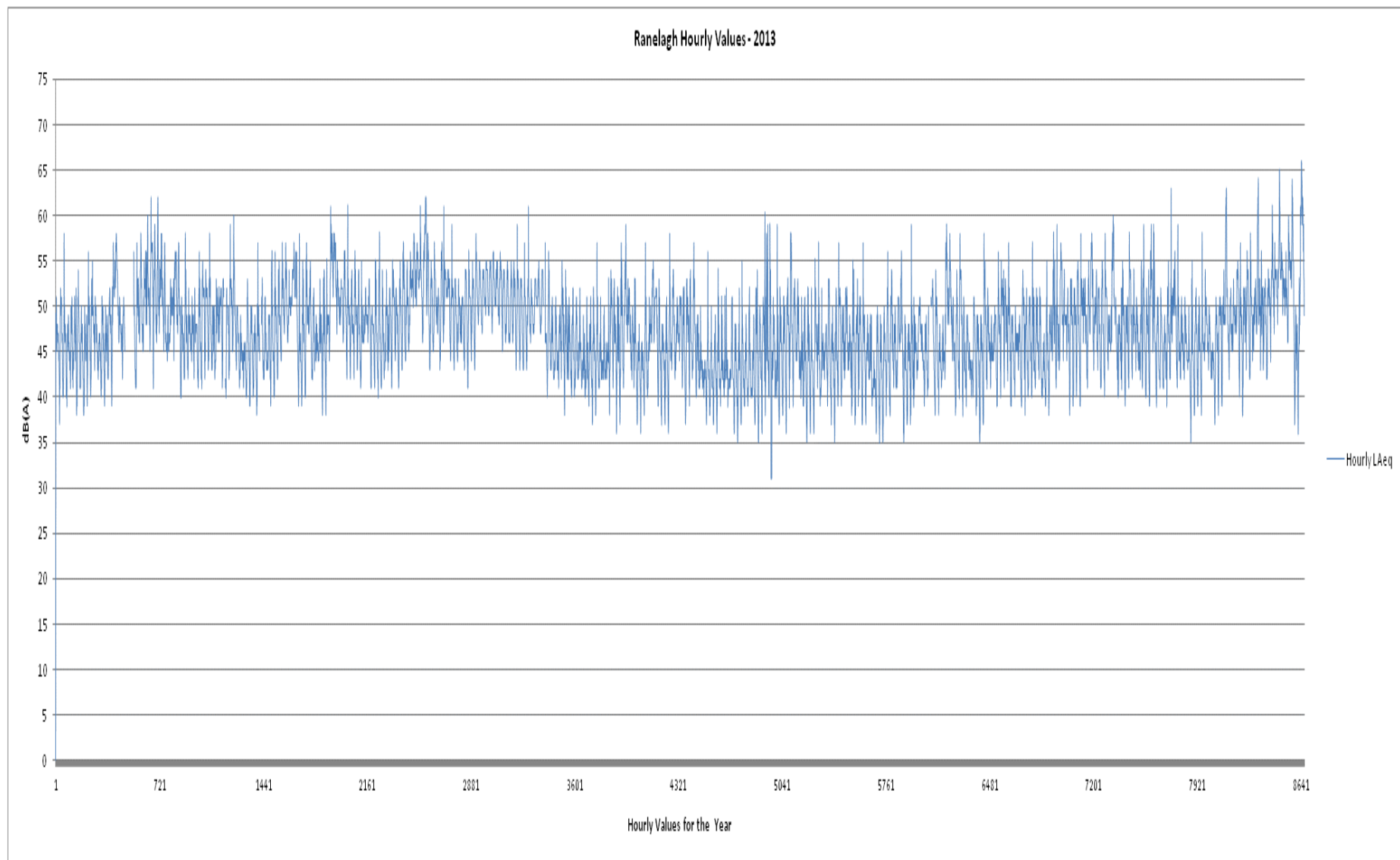
Walkinstown September '13' Hourly Values

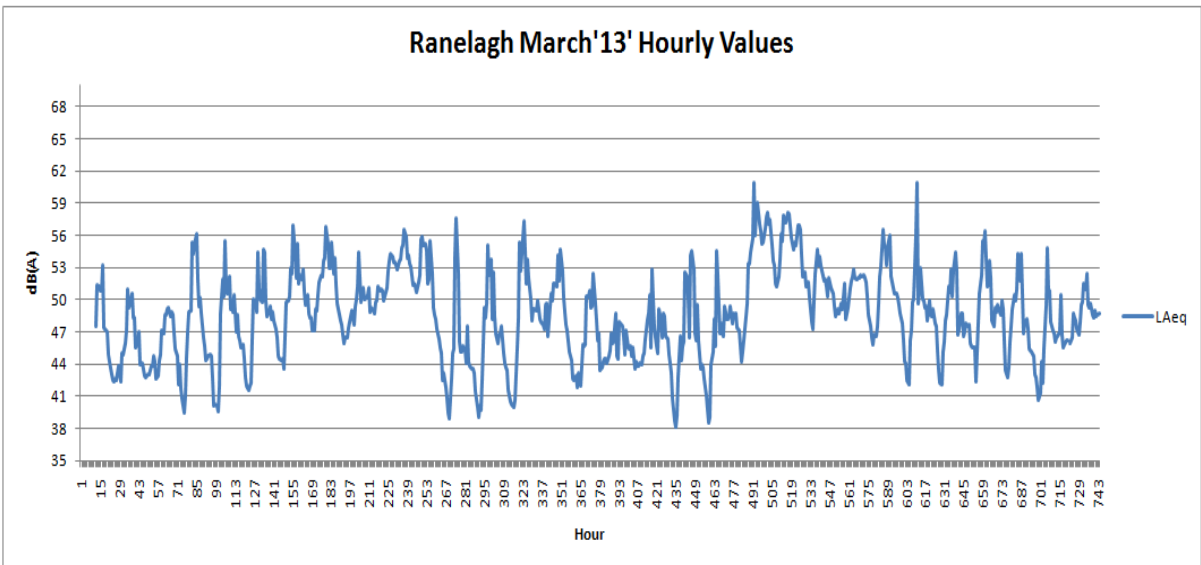
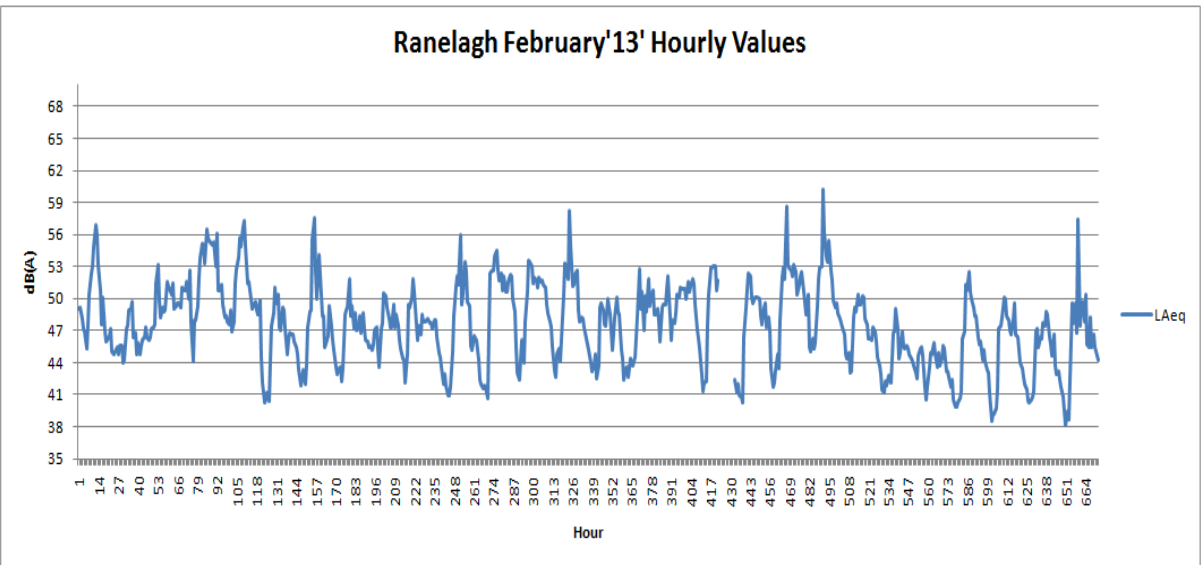
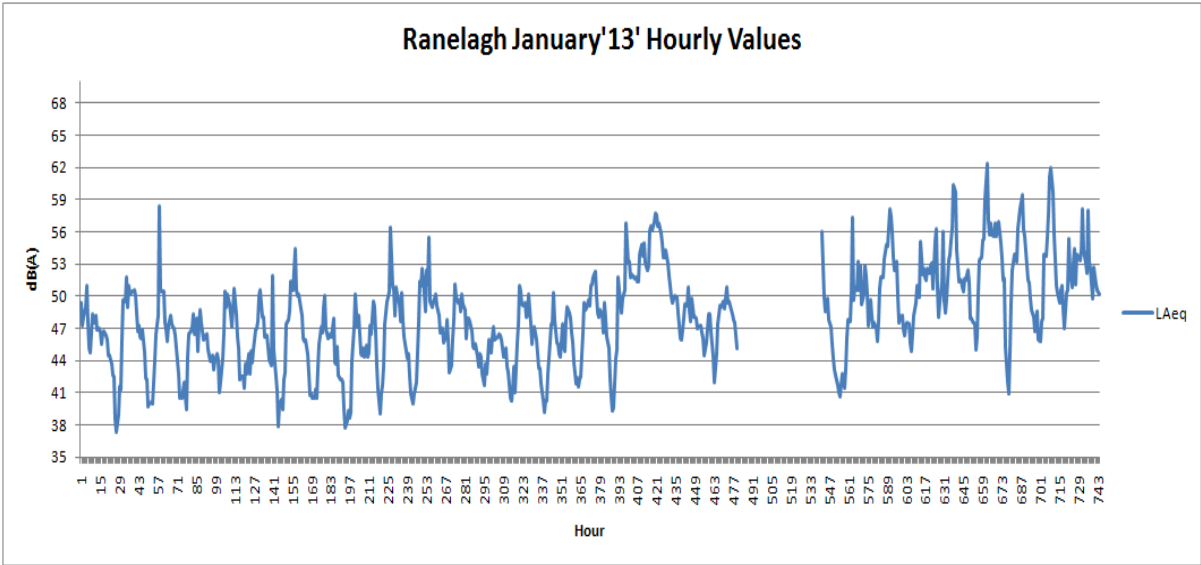


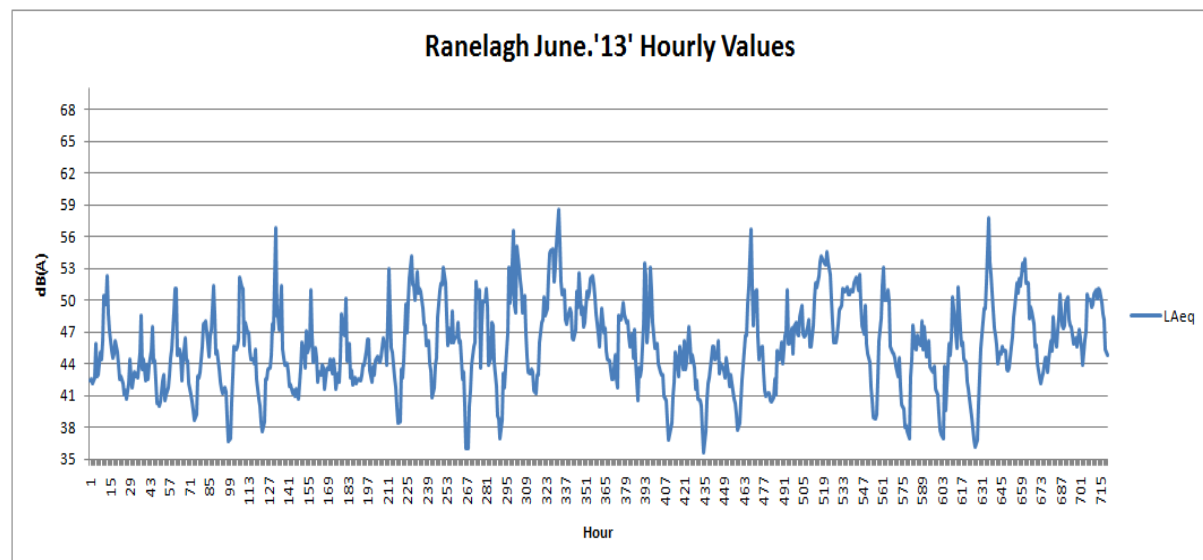
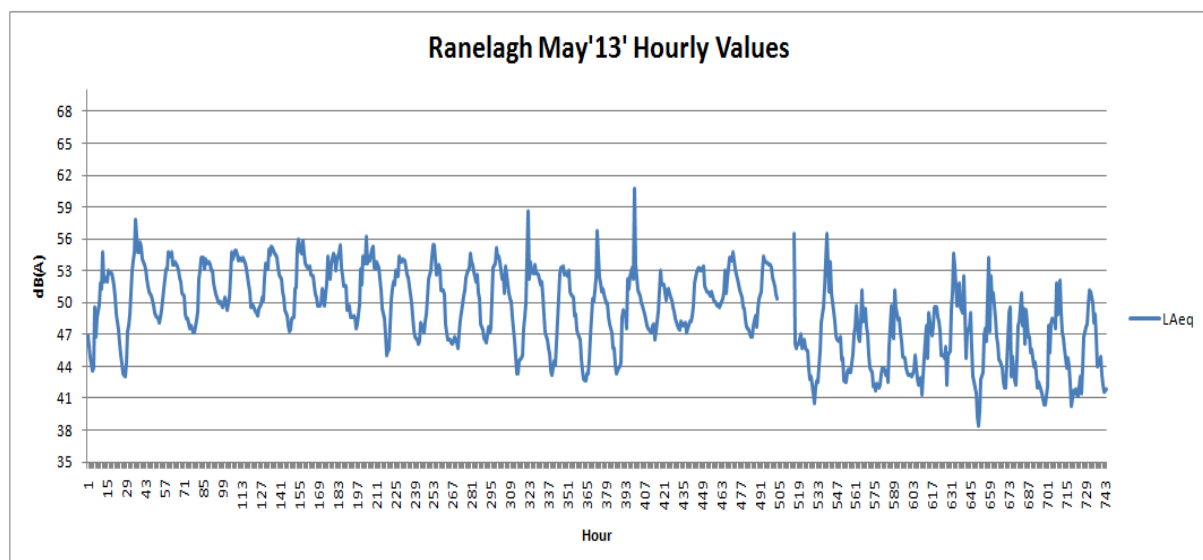
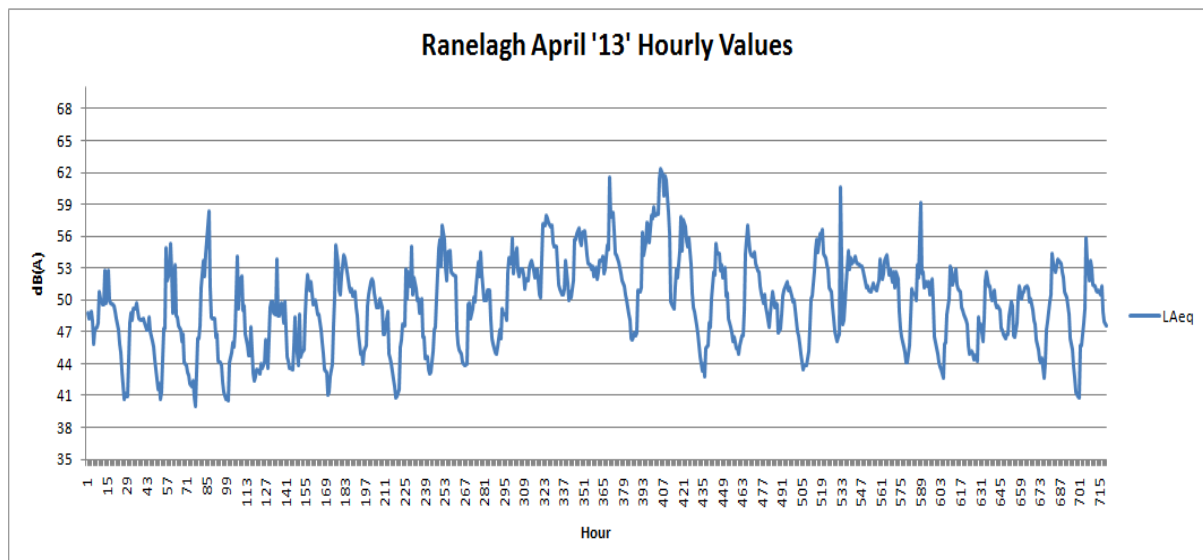


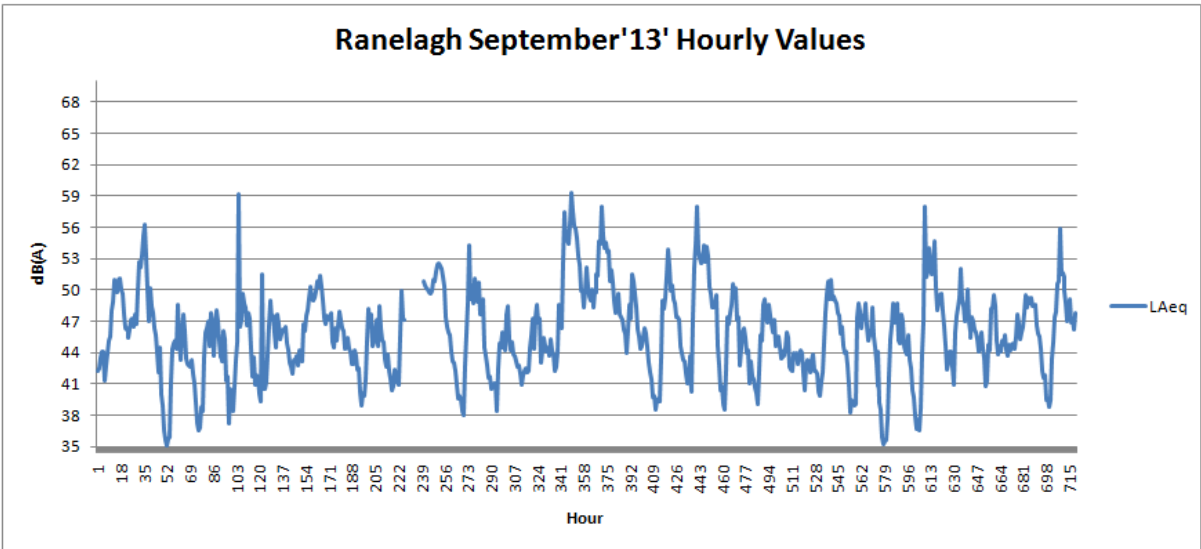
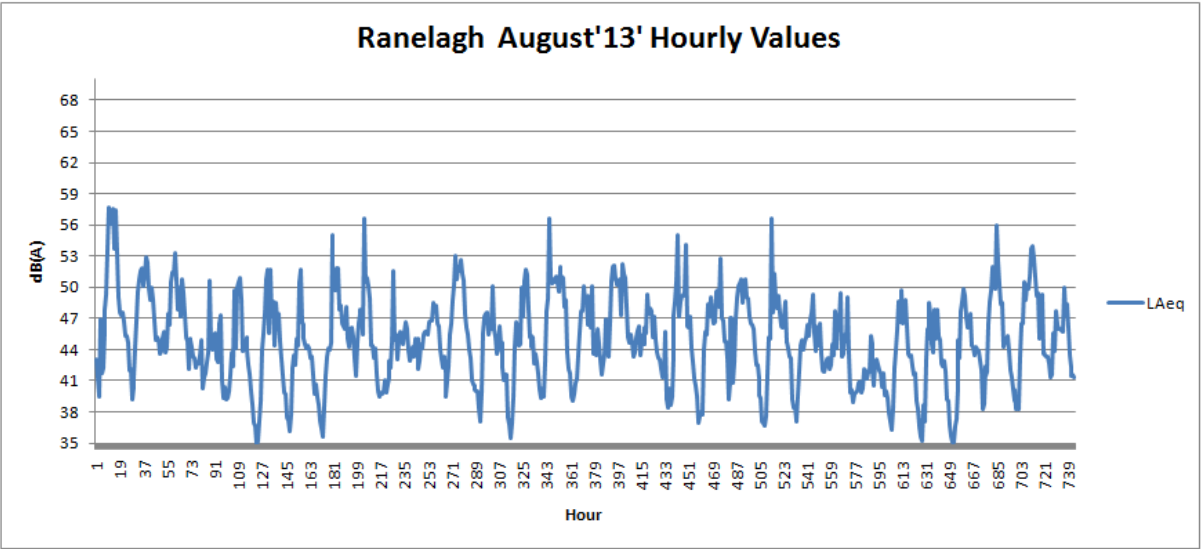
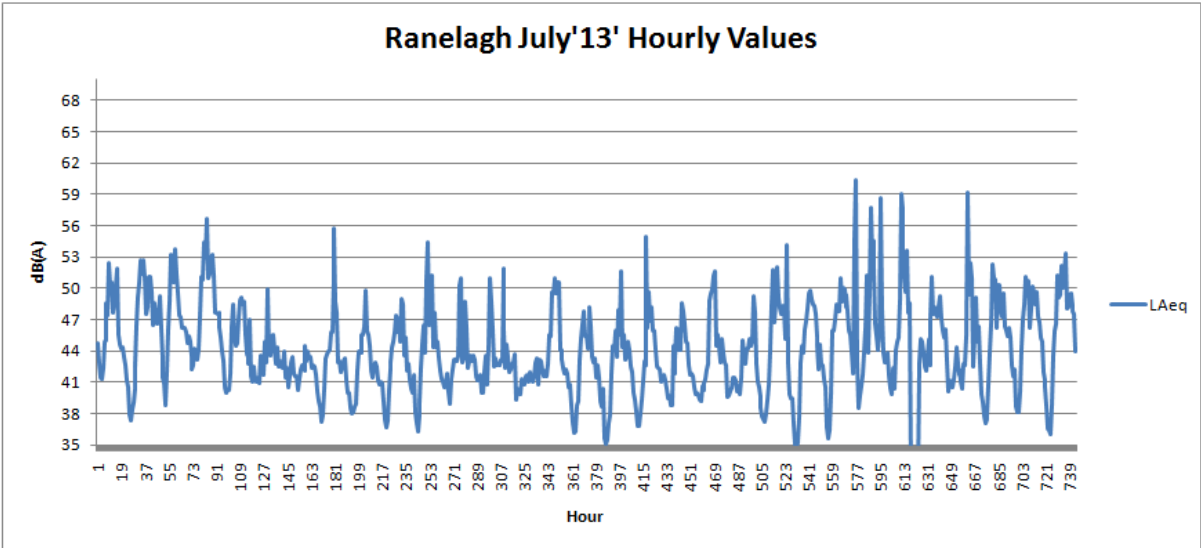
WOODSTOCK STOCK GARDENS
RANELAGH
DUBLIN 6

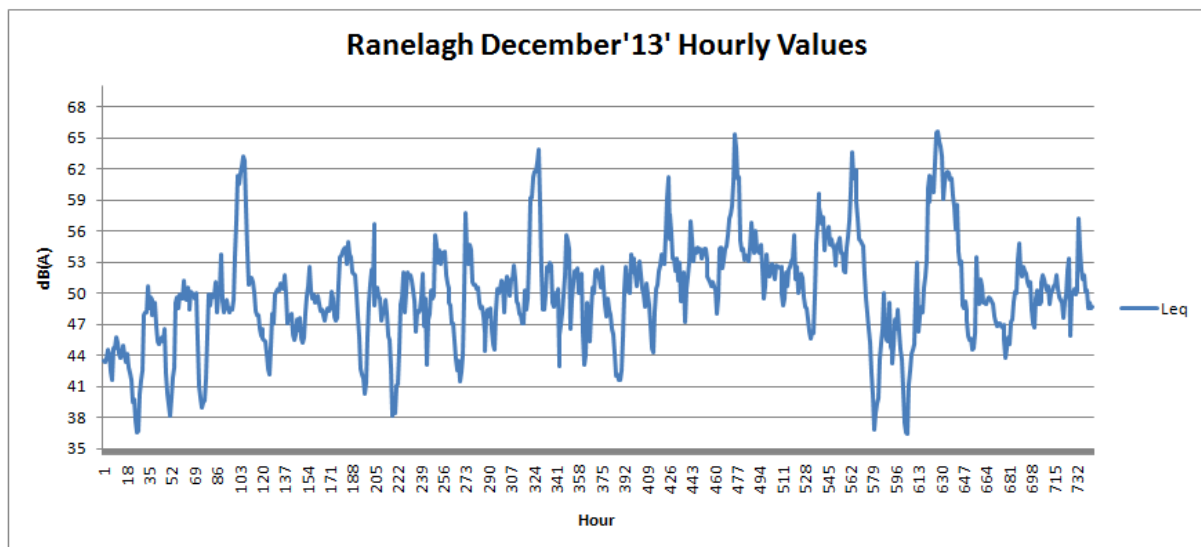
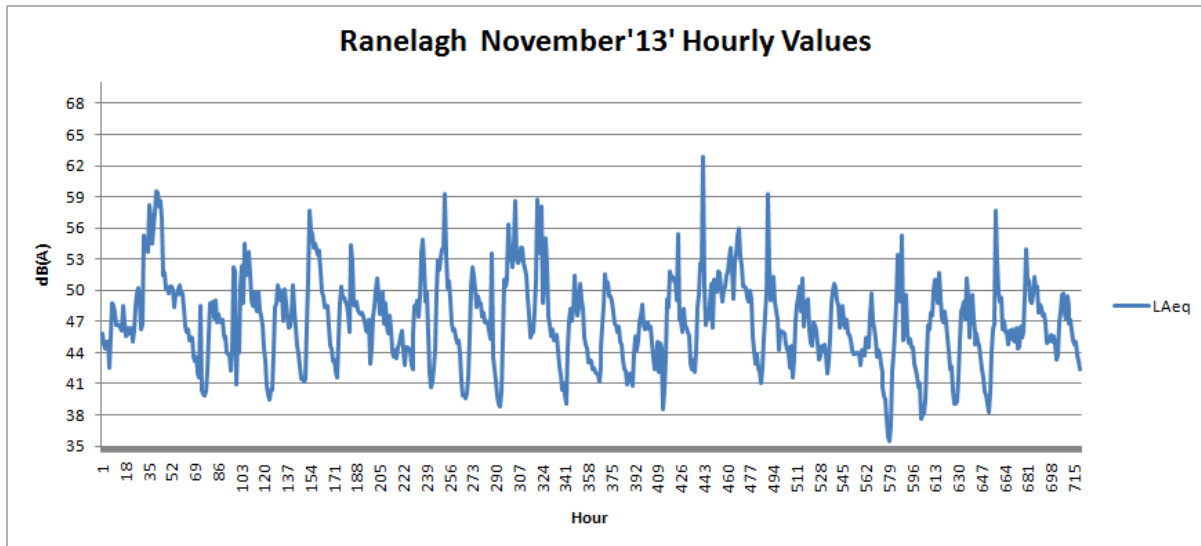
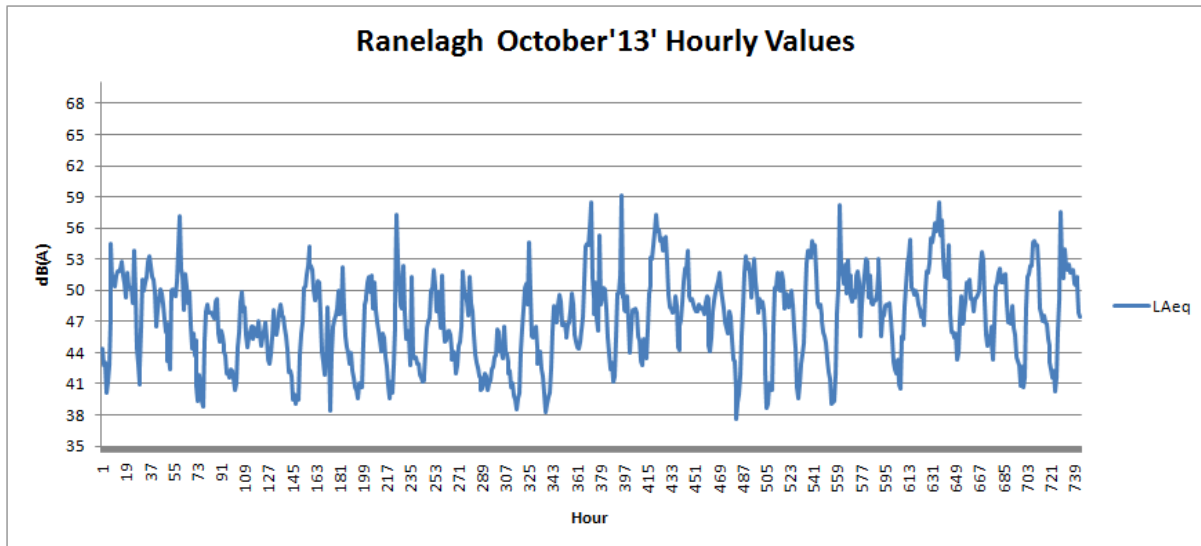




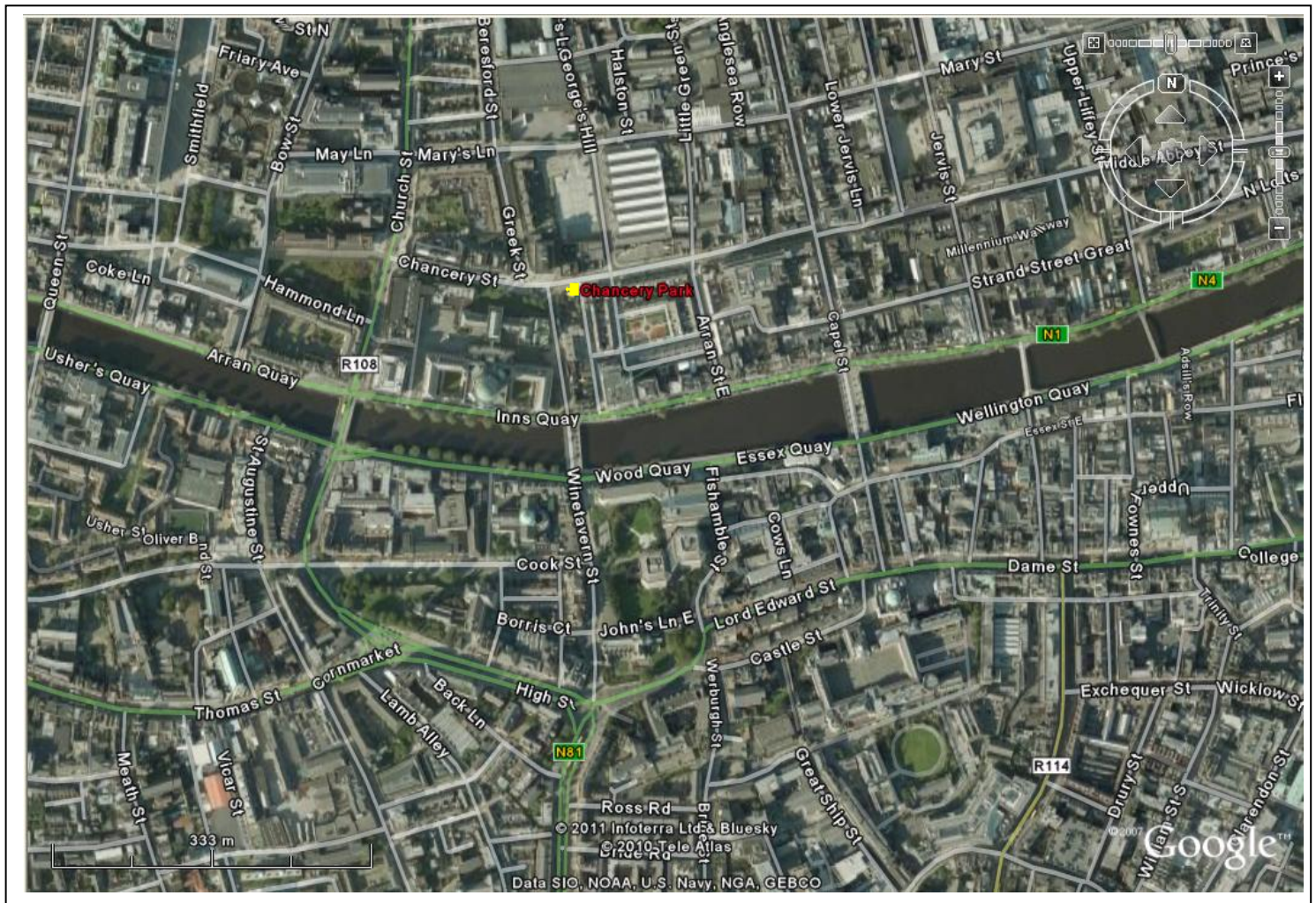


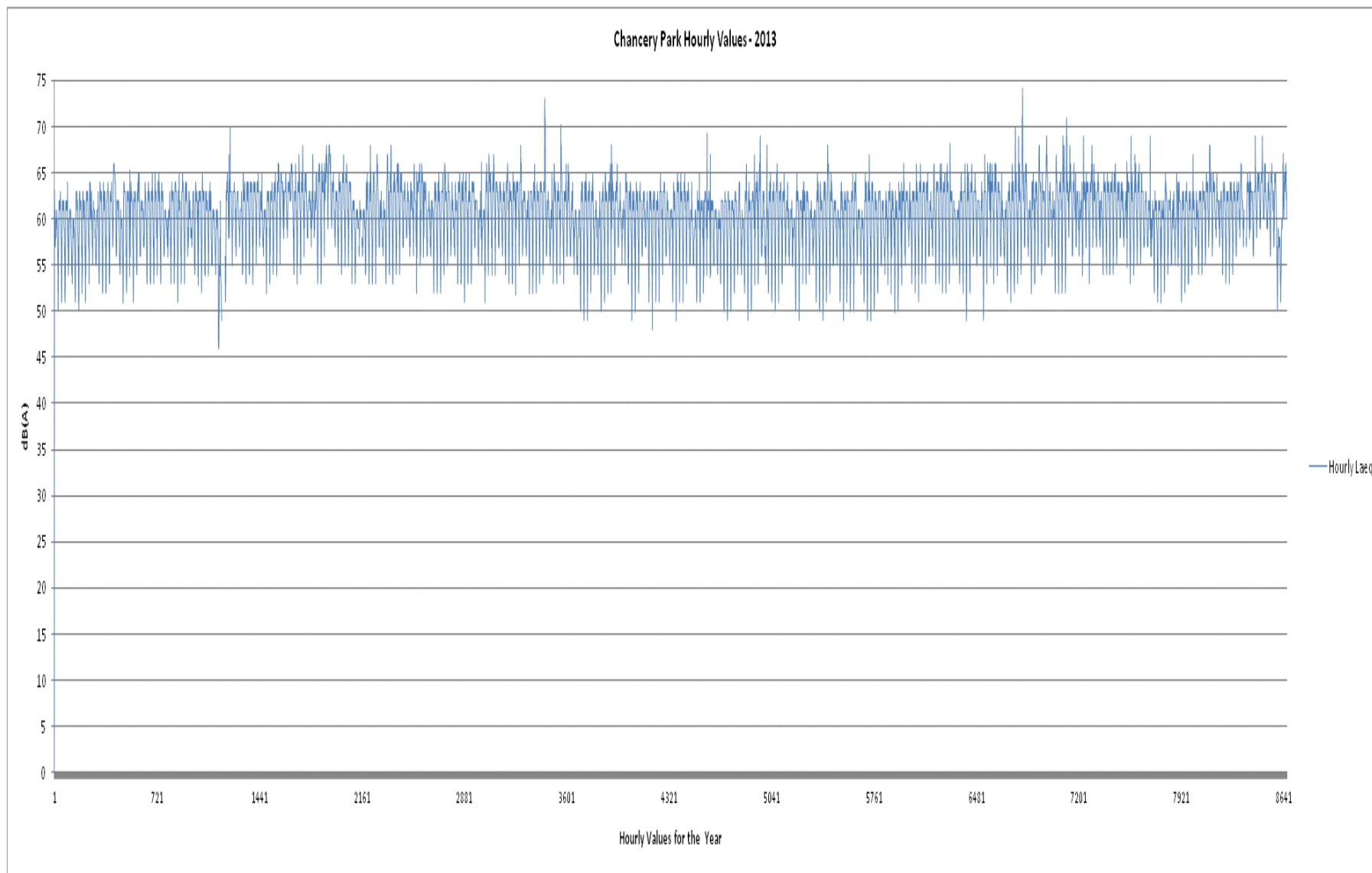


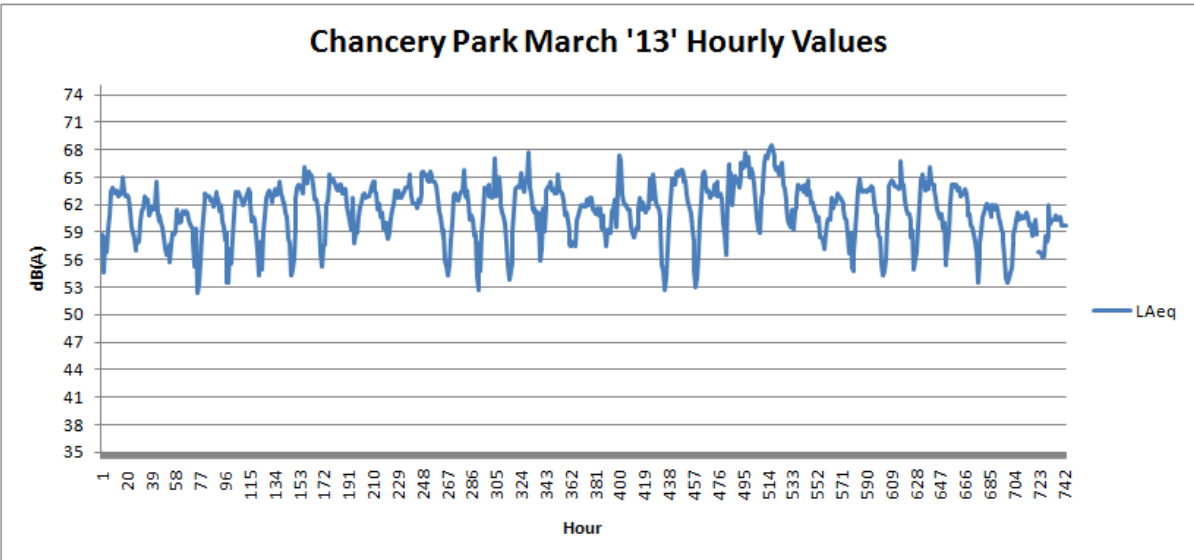
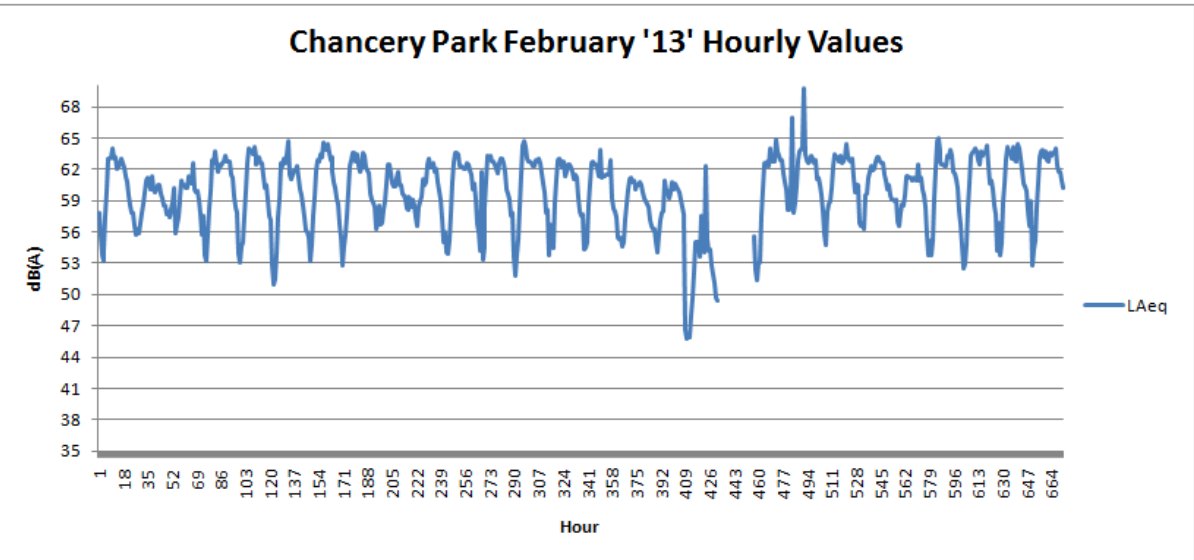
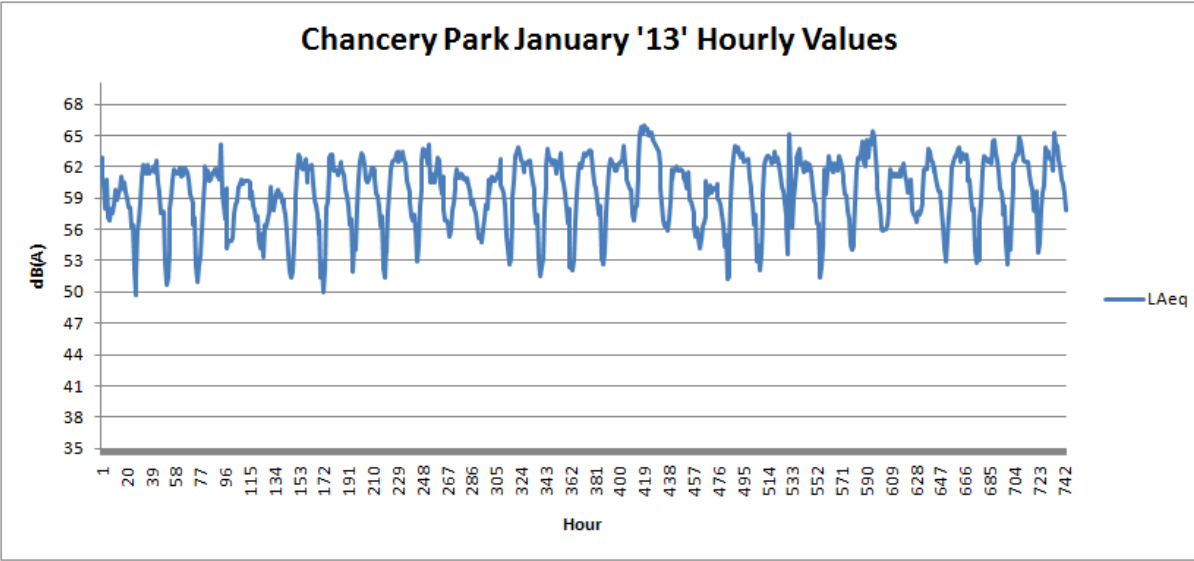


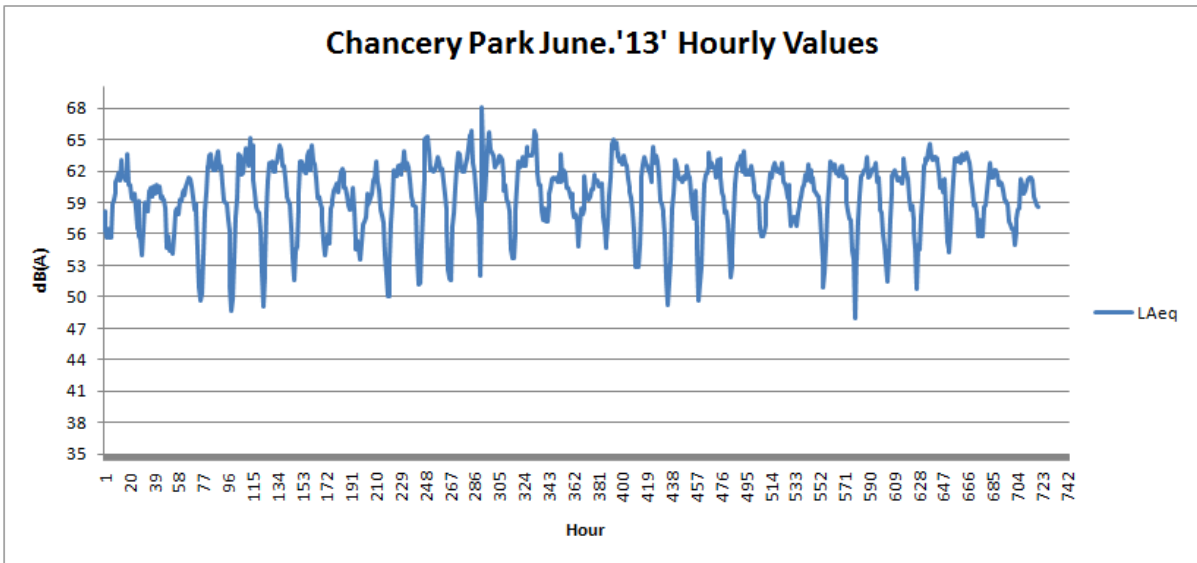
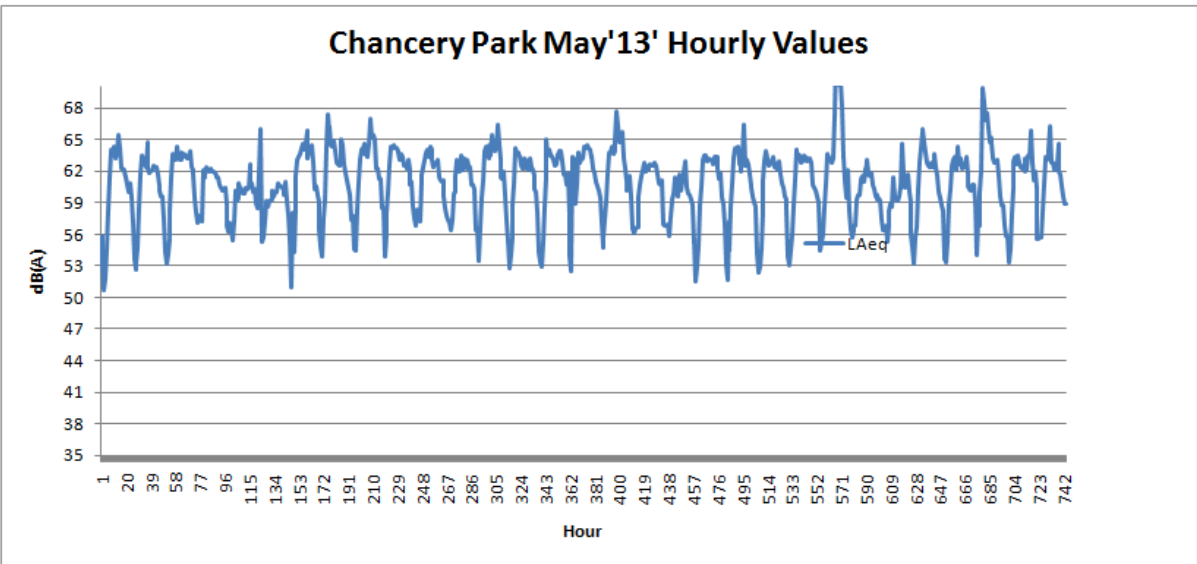
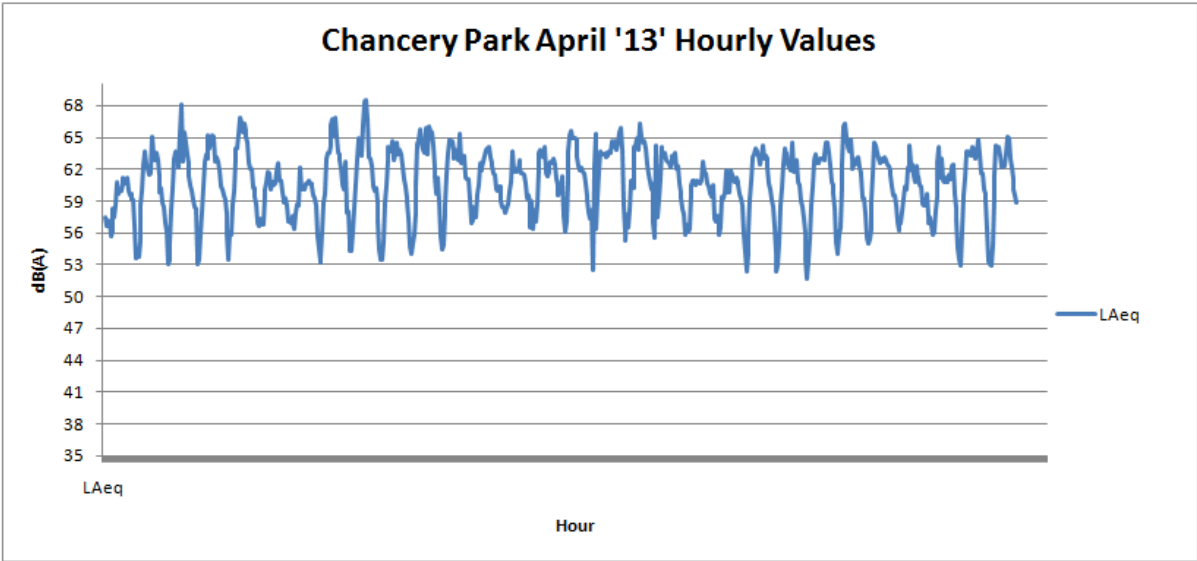


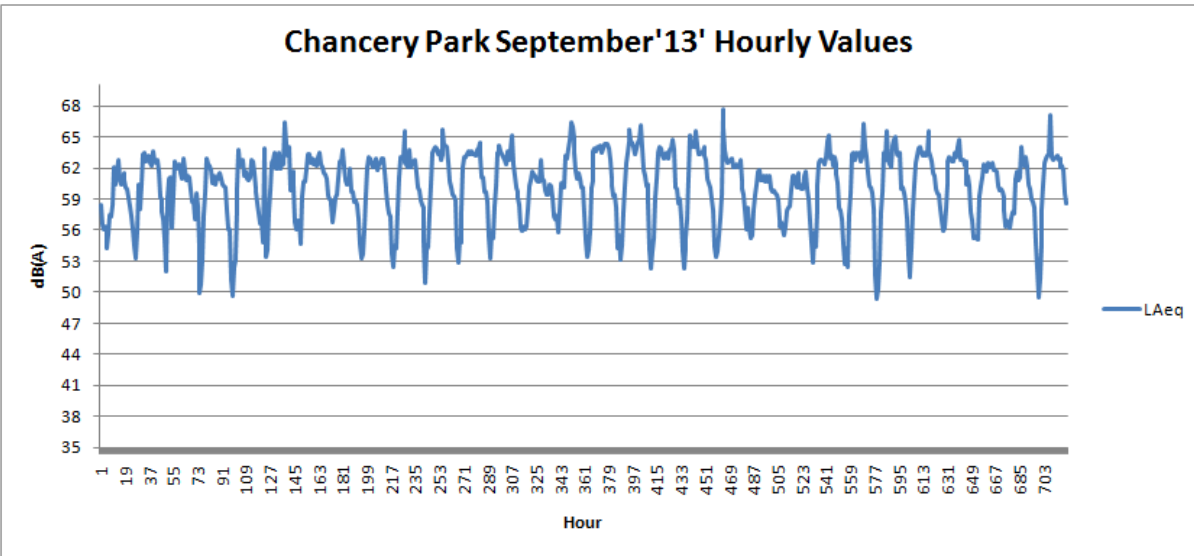
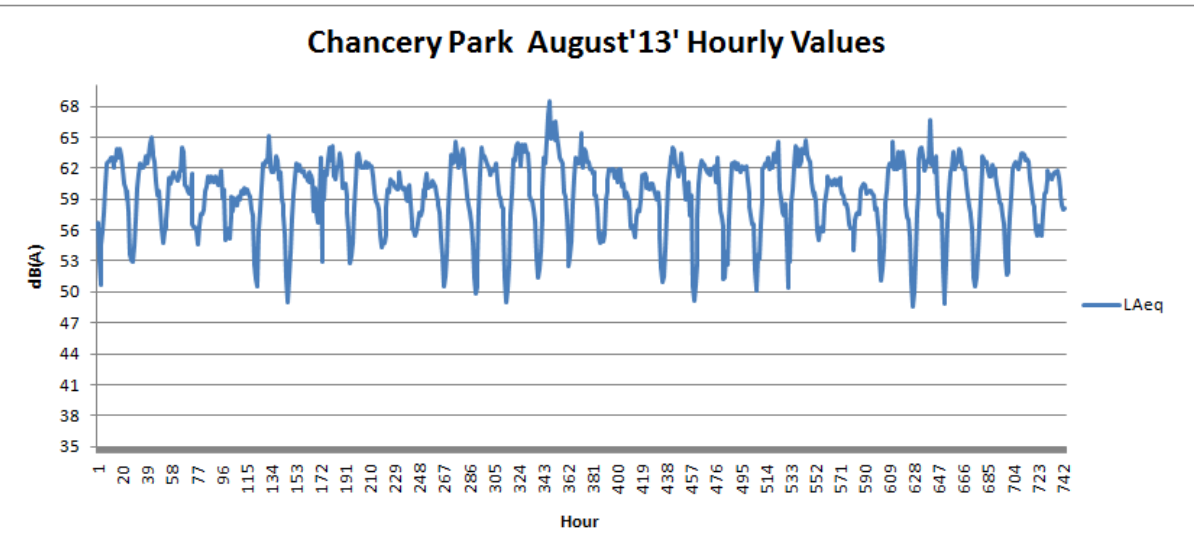
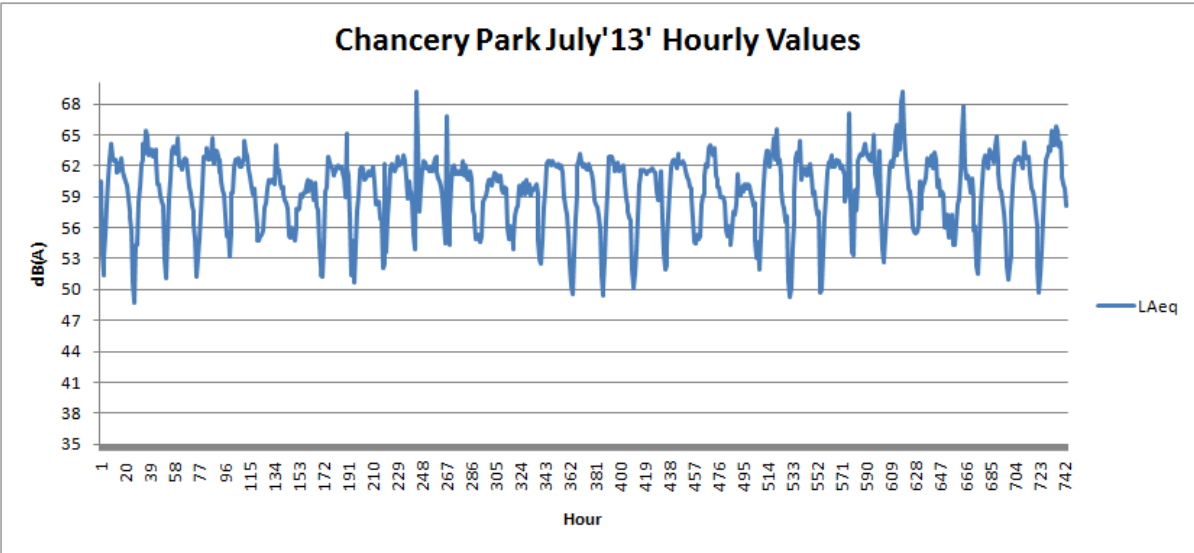
CHANCERY PARK
CHANCERY ST.
DUBLIN 1

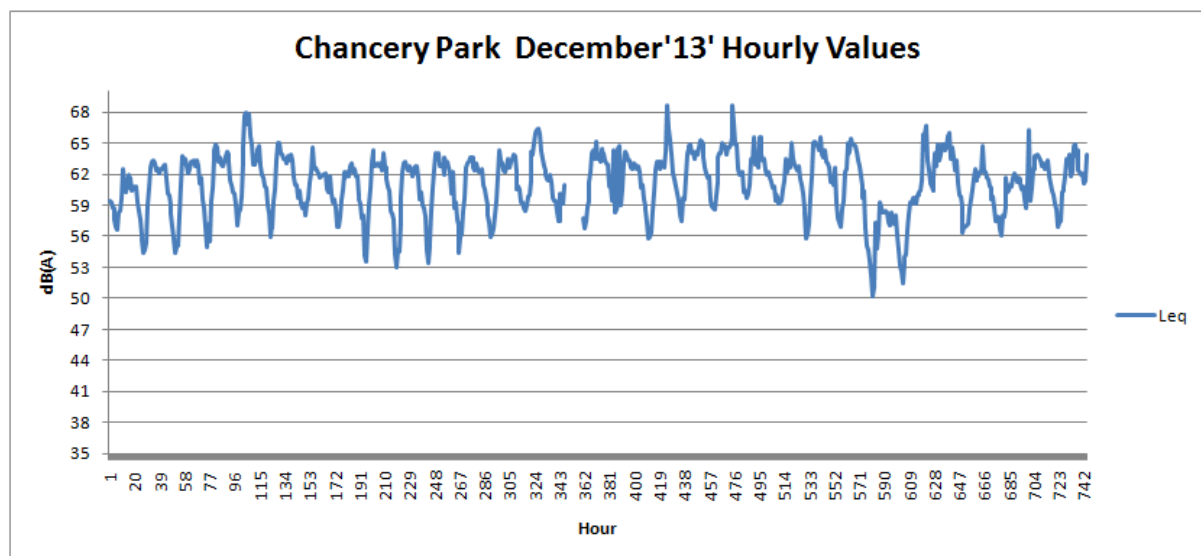
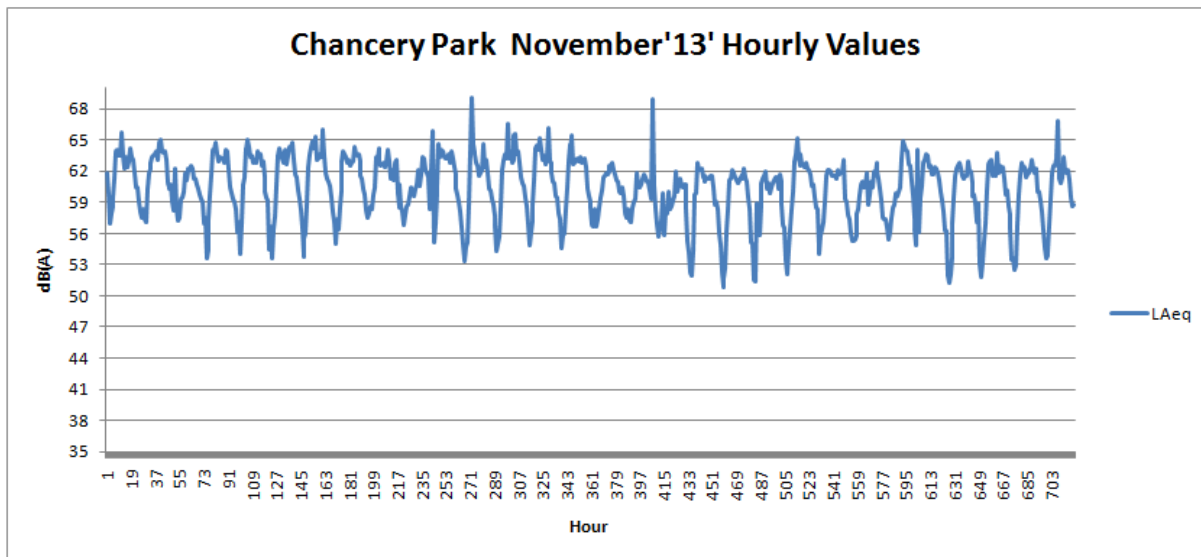
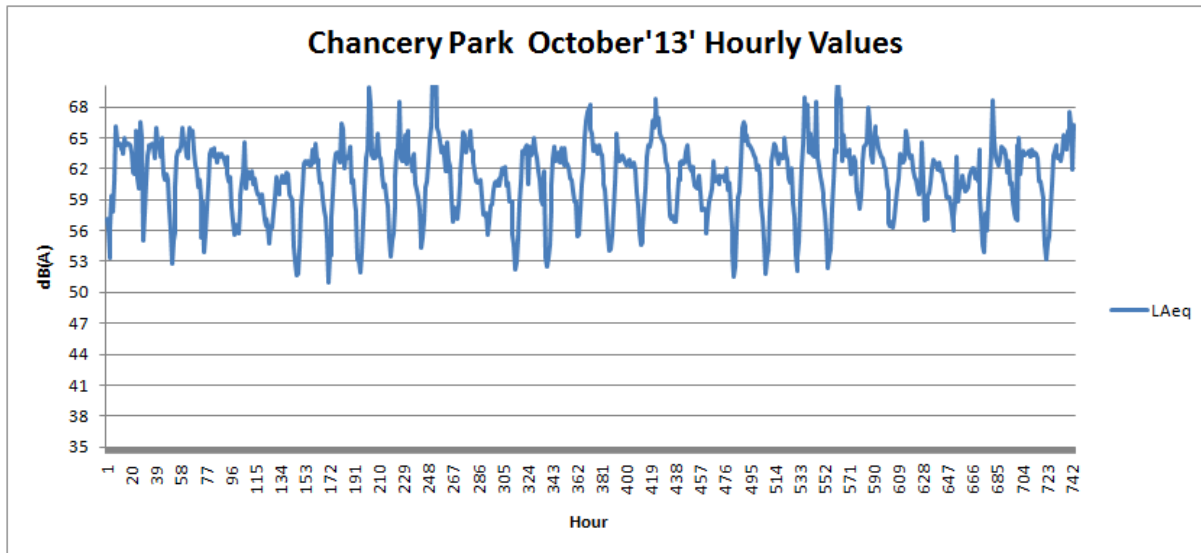






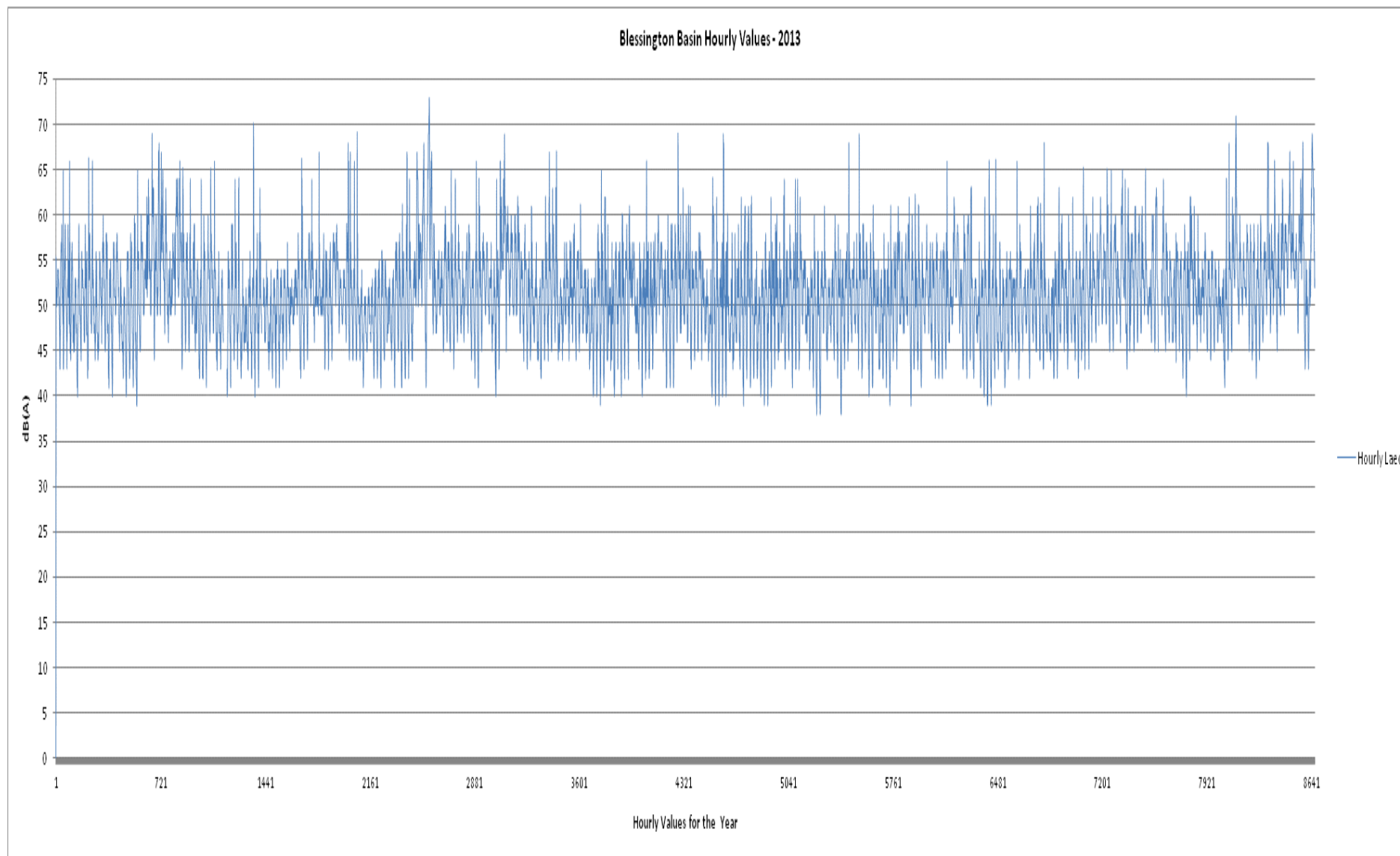




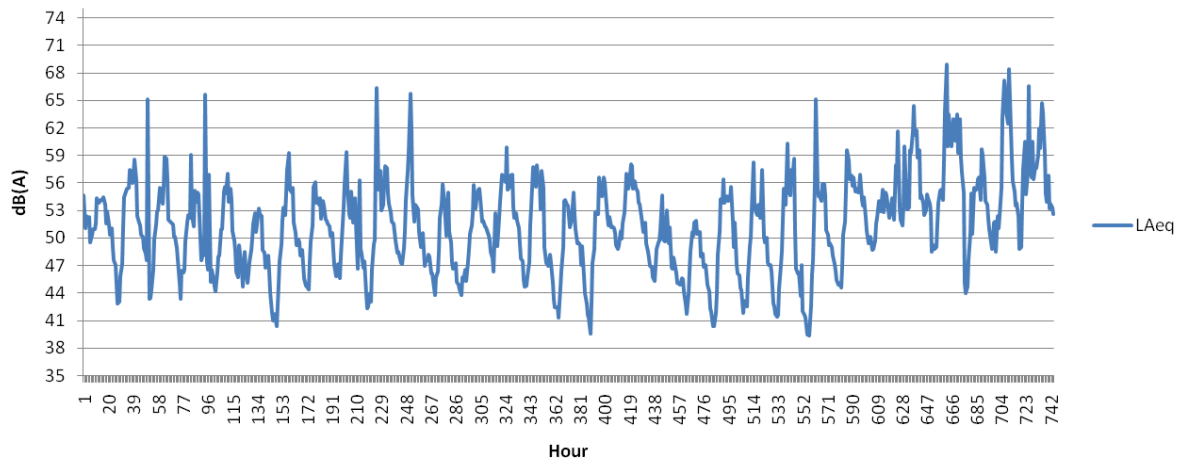


Blessington Basin
Blessington St.
DUBLIN 1

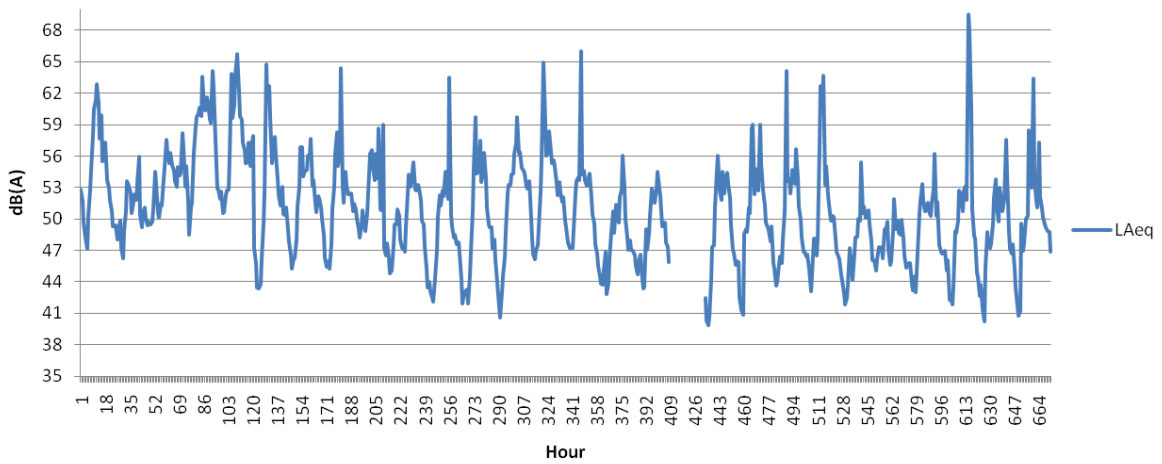




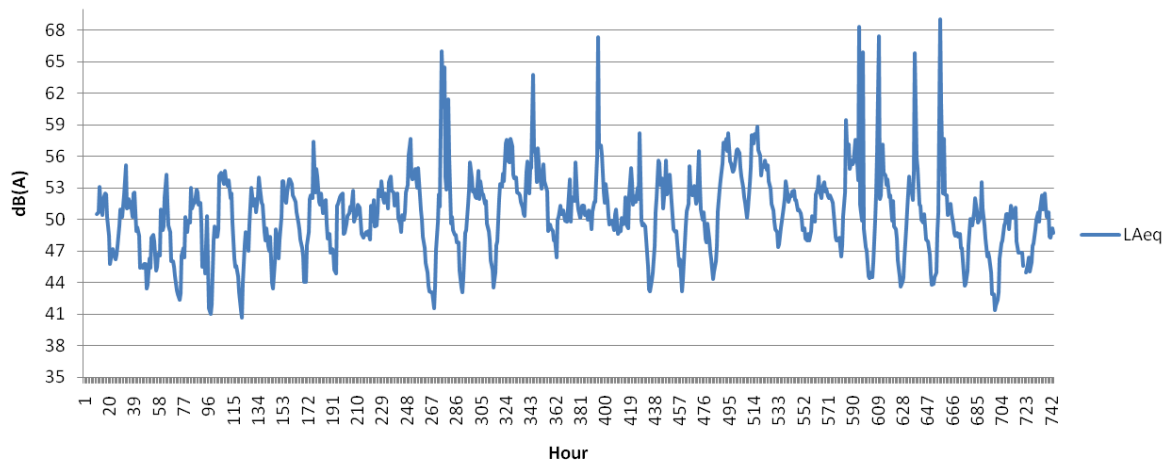
Blessington Basin January '13' Hourly Values

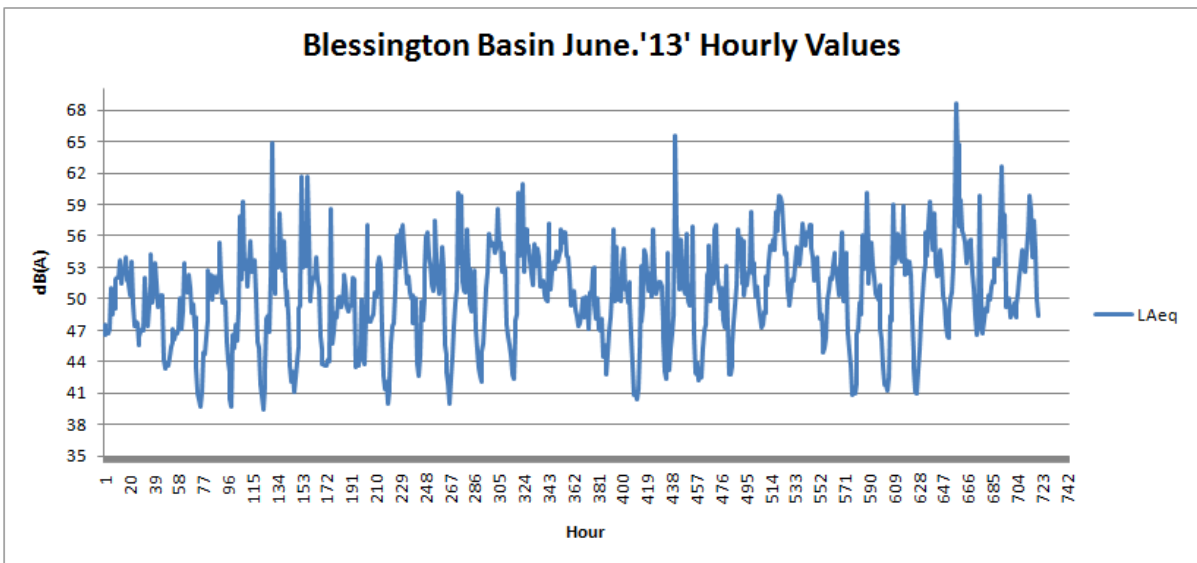
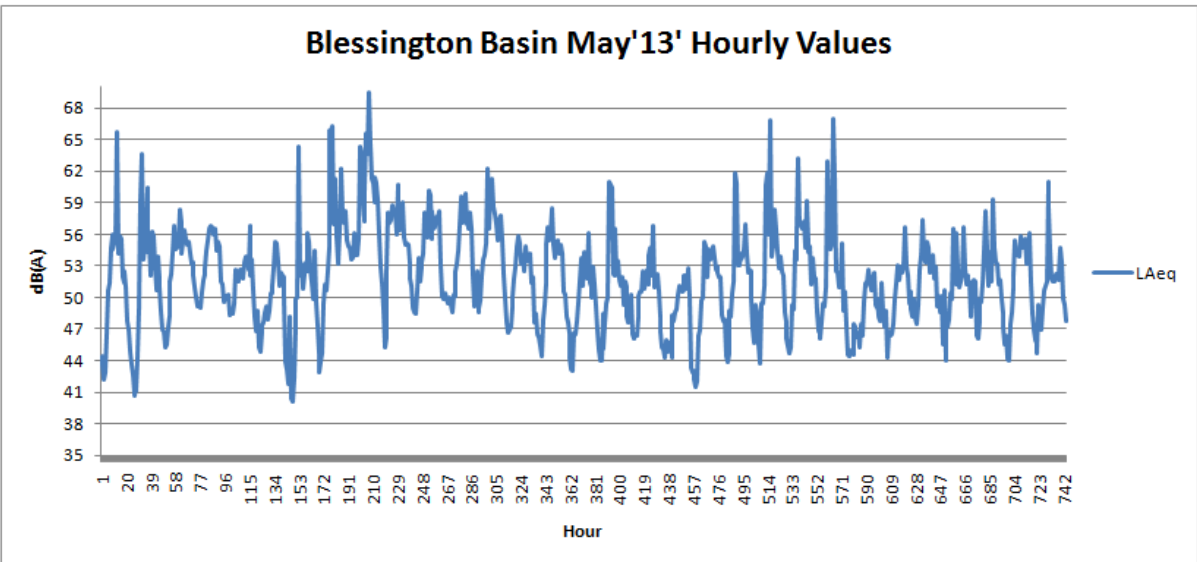
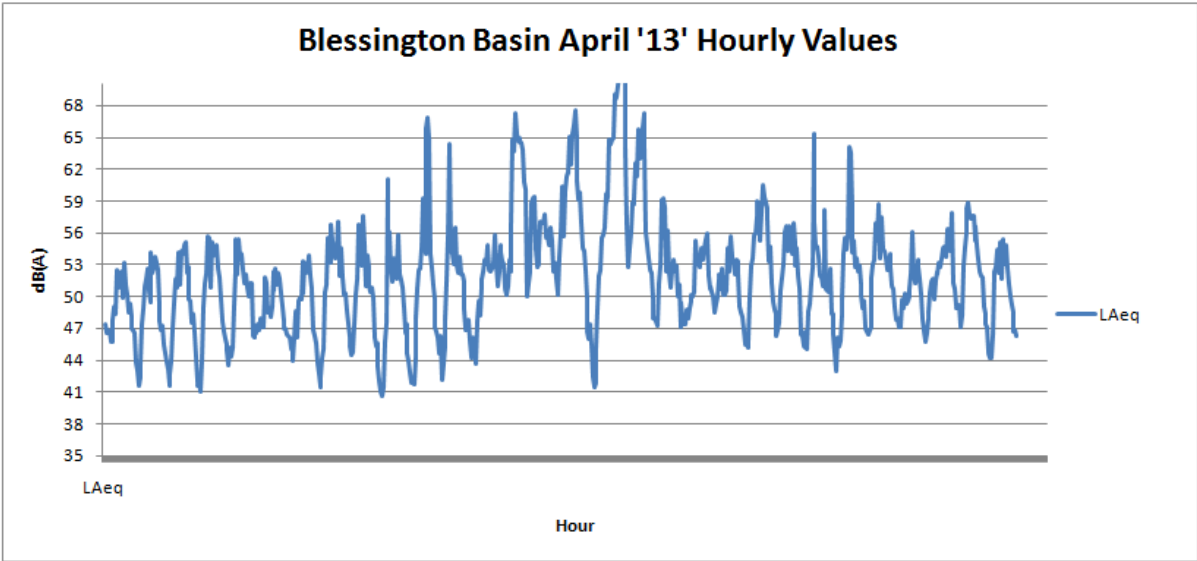


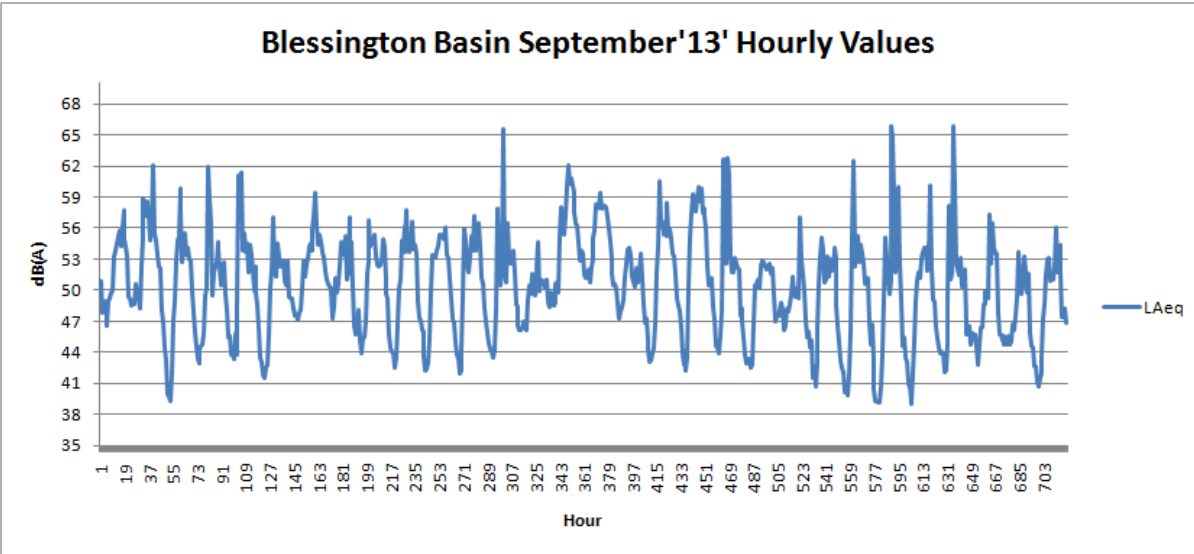
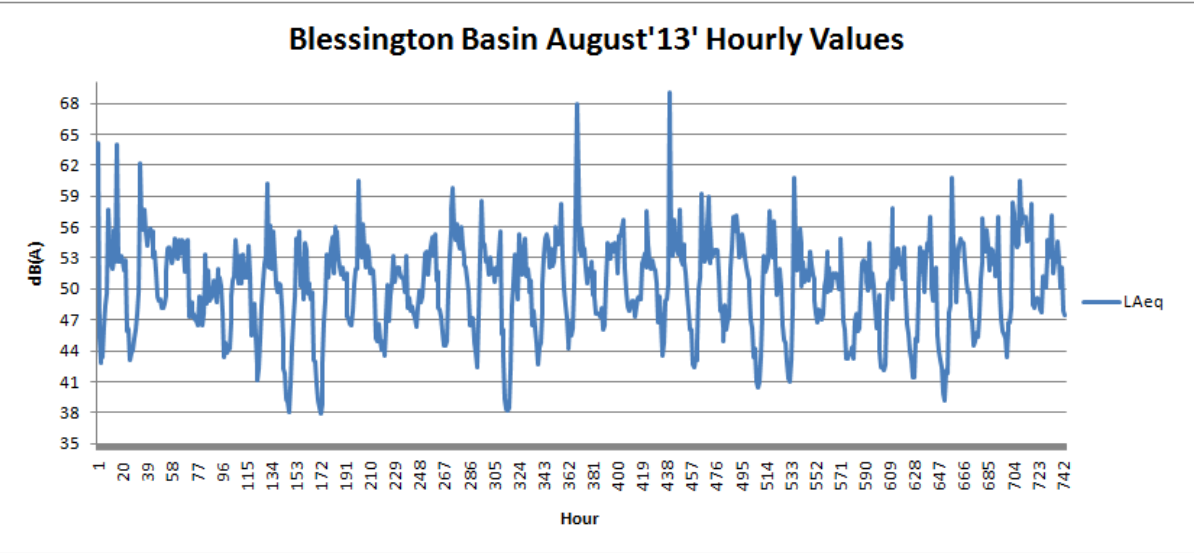
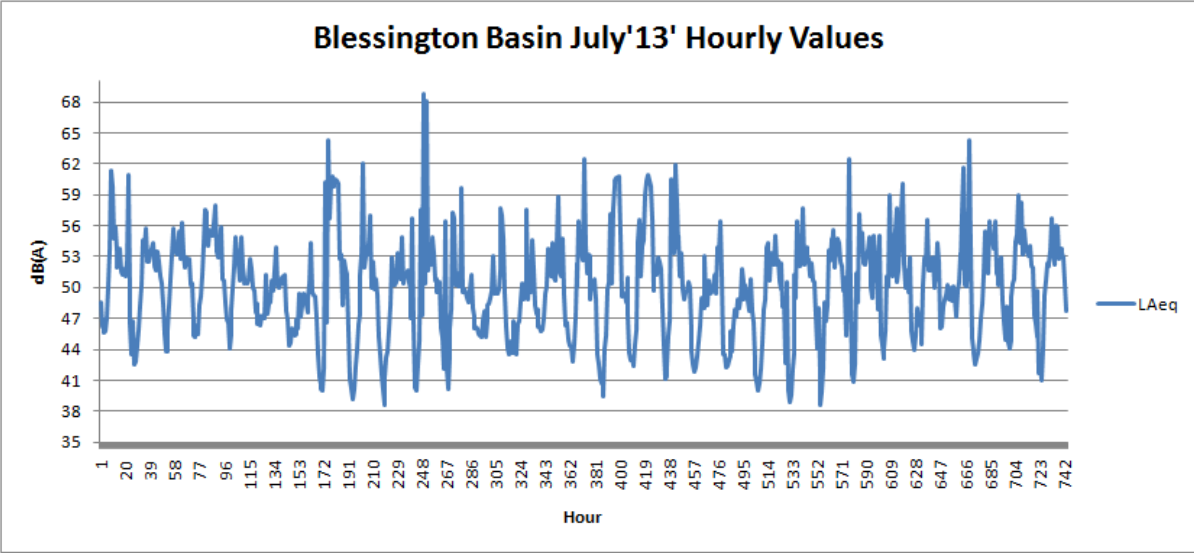
Blessington Basin February '13' Hourly Values

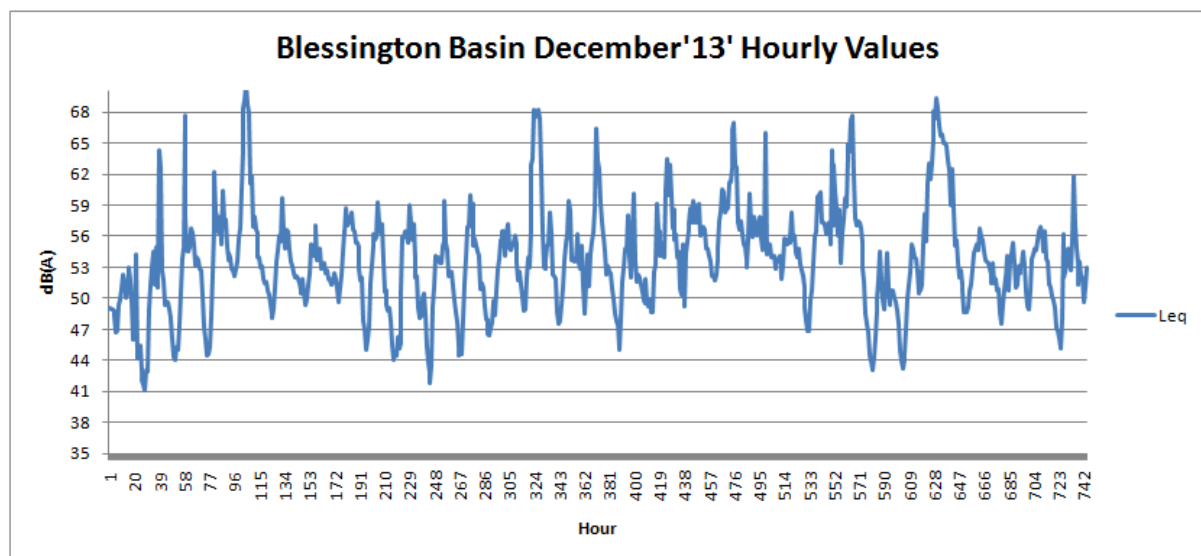
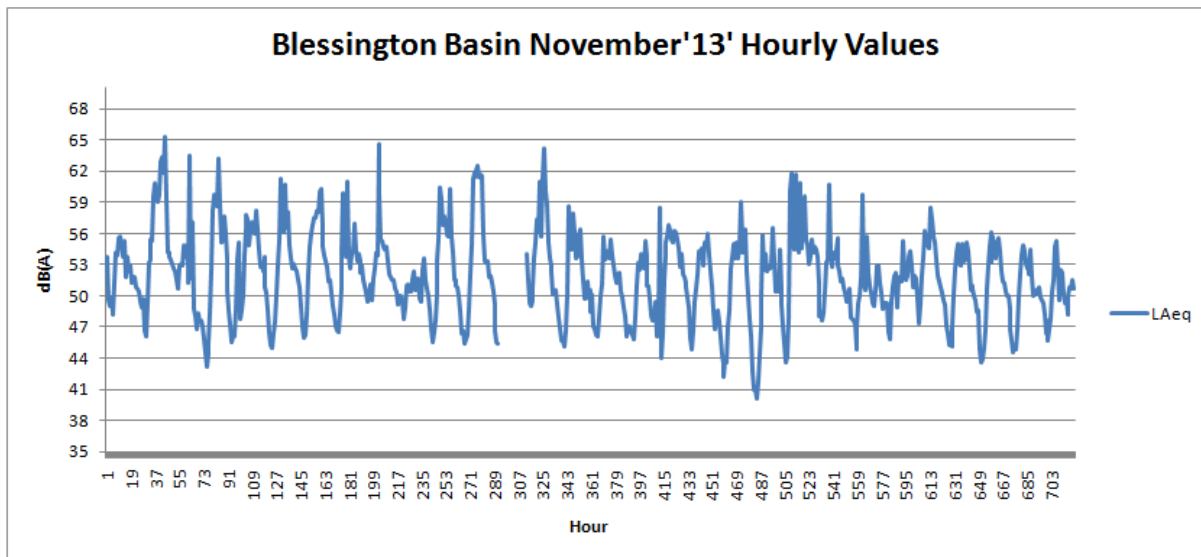
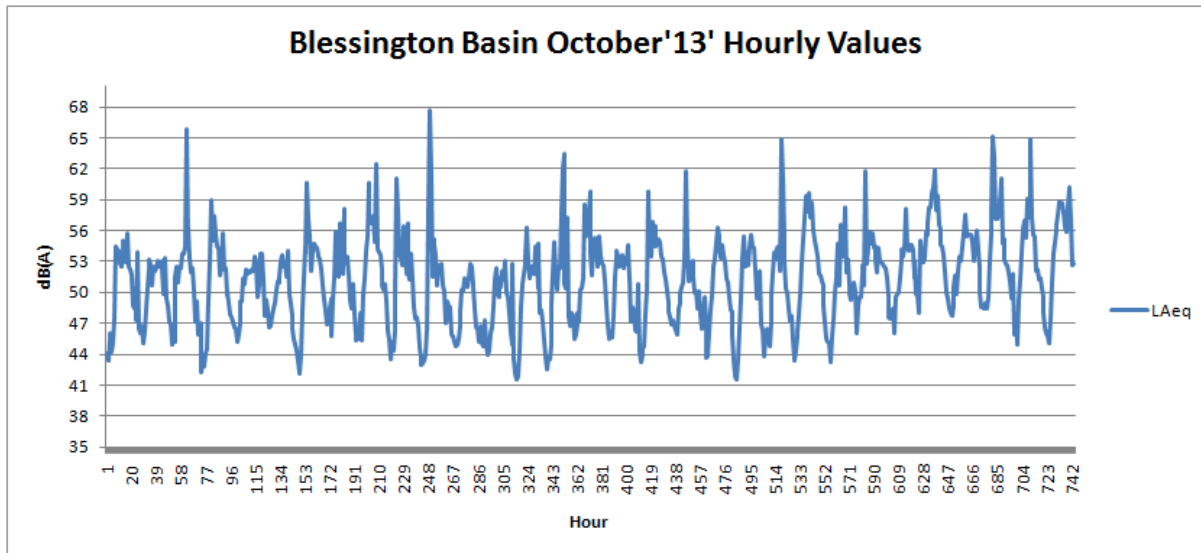


Blessington Basin March '13' Hourly Values









Notes

