Bloch Wind Farm

Technical Appendix 11.8: Suggested Planning Conditions

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Contents

1 Introduction

11.1.1 If the wind farm was successful in its application for planning permission any resulting decision notice would likely contain appropriately worded noise conditions, written so as to be in accordance with Circular 4/1998 The Use of Conditions in Planning Permissions[1].

11.1.2 Such conditions would provide a degree of protection to nearby residents under planning law. To that end, presented below are a set of relevant, precise and enforceable conditions that RES suggest may be considered as appropriate. The form of condition wording suggested has been adopted at sites such as Freasdail[2], Minnygap[3], Roos[4], Solwaybank[5] and Wryde Croft[6]. Any final conditions attached to the proposal would be according to the discretion of the decision maker.

11.1.3 The proposed noise limits are derived by subtracting the predicted noise levels due to Solwaybank Wind Farm from the total ETSU-R-97 limit deemed appropriate in the cumulative assessment. Prior to this the predicted noise levels for Solwaybank are scaled to the relevant conditioned noise limits using the controlling property method recommended in the IoA GPG. This results in noise limits for the proposed development alone such that the cumulative noise limit is met in combination with the existing Solwaybank Wind Farm.

11.1.4 Following the above calculation the noise limits for the proposed development have been amended so that they do not exceed the limits proposed in the assessment of the proposed development alone i.e. a lower limit of 37.5dB(A) or background noise plus 5dB(A) during the day. The limits are consistent with those of Tables 11.29 and 11.30 of the Chapter.

[1] Circular 4/1998, "The Use of Conditions in Planning Permissions", Scottish Government, February 1998

[2] Directorate for Planning and Environmental Appeals, Appeal Decision Notice, Appeal Reference PPA-130-2036, Decision Date: 15 April 2014

[3] Directorate for Planning and Environmental Appeals, Appeal Decision Notice, Appeal Reference PPA-170-2055, Decision Date: 19 June 2014

[4] The Planning Inspectorate, Appeal Decision, Appeal Reference: APP/E2001/A/09/2113076, Decision Date: 21 June 2010

[5] Directorate for Planning and Environmental Appeals, Appeal Decision Notice, Appeal Reference PPA-170-2091, Decision Date: 23 September 2014

[6] The Planning Inspectorate, Appeal Decisions for Appeal References: APP/J0540/A/08/2083801 and APP/J0540/A/08/2090541, Decision Date: 1 April 2010

2 Suggested Planning Condition Wording

1. The level of noise immissions from the combined effects of the wind turbines (including the application of any tonal penalty) when calculated in accordance with the attached Guidance Notes, shall not exceed the values set out in the attached Table 1 or Table 2 (as appropriate). Noise limits for dwellings which lawfully exist or have planning permission for construction at the date of this consent but are not listed in the Tables attached shall be those of the physically closest location listed in the Tables unless otherwise agreed with the Local Planning Authority. The coordinate locations to be used in determining the location of each of the dwellings listed in Tables 1 and 2 shall be those listed in Table 3.
2. Within 21 days from the receipt of a written request from the Local Planning Authority and following a complaint to the Local Planning Authority from the occupant of a dwelling which lawfully exists or has planning permission at the date of this consent, the wind farm operator shall, at the wind farm operators expense, employ an independent consultant approved by the Local Planning Authority to assess the level of noise immissions from the wind farm at the complainant's property following the procedures described in the attached Guidance Notes.
3. The wind farm operator shall provide to the Local Planning Authority the independent consultant's assessment and conclusions regarding the said noise complaint, including all raw data upon which those assessments and conclusions are based. Such information shall be provided within 2 months of the date of the written request of the Local Planning Authority, with an additional 3 weeks allowed should further investigation pursuant to Guidance Note 4 be required, unless otherwise extended in writing by the Local Planning Authority.
4. Wind speed, wind direction and power generation data shall be continuously logged and provided to the Local Planning Authority at its request and in accordance with the attached Guidance Notes within 14 days of such request. Such data shall be retained for a period of not less than 24 months.
5. No development shall commence until there has been submitted to the Local Planning Authority details of a nominated representative for the

development to act as a point of contact for local residents (in connection with conditions 1 - 4) together with the arrangements for notifying and approving any subsequent change in the nominated representative. The nominated representative shall have responsibility for liaison with the Local Planning Authority in connection with any noise complaints made during the construction, operation and decommissioning of the wind farm.

SCHEDULE OF NOISE GUIDANCE NOTES

These notes form part of conditions 1-5. They further explain these conditions and specify the methods to be deployed in the assessment of complaints about noise immissions from the wind farm.

Reference to ETSU-R-97 refers to the publication entitled "The Assessment and Rating of Noise from Wind Farm" (1997) published by the Energy Technology Support unit (ETSU) for the Department of Trade and Industry (DTI).

Note 1

(a) Values of the LA90,10min noise statistic shall be measured at the complainant's property using a sound level meter of EN 60651/BS EN 60804 Type 1, or EN 61672 Class 1 quality (or the replacement thereof) set to measure using a fast time weighted response as specified in BS EN 60651/BS EN 60804 or BS EN 61672-1 (or the equivalent UK adopted standard in force at the time of the measurements). This shall be calibrated in accordance with the procedure specified in BS 4142: 1997 (or the replacement thereof). These measurements shall be made in such a way that the requirements of Note 3 shall also be satisfied.

(b) The microphone should be mounted at 1.2 - 1.5 m above ground level, fitted with a two layer windshield (or suitable alternative approved in writing from the Local Planning Authority), and placed outside the complainant's dwelling. Measurements should be made in "free-field" conditions. To achieve this, the microphone should be placed at least 3.5 m away from the building facade or any

reflecting surface except the ground at a location agreed with the Local Planning Authority.

(c) The LA90,10min measurements shall be synchronised with measurements of the 10-minute arithmetic mean wind speed and with operational data, including power generation information for each wind turbine, from the turbine control systems of the wind farm.

(d) The wind farm operator shall continuously log arithmetic mean wind speed and arithmetic mean wind direction data in 10 minute periods on the wind farm site to enable compliance with the conditions to be evaluated. The mean wind speed at hub height shall be 'standardised' to a reference height of 10 metres as described in ETSU-R-97 at page 120 using a reference roughness length of 0.05 metres. It is this standardised 10 m height wind speed data which is correlated with the noise measurements of Note 2(a) in the manner described in Note 2(c).

Note 2

(a) The noise measurements shall be made so as to provide not less than 20 valid data points as defined in Note 2 paragraph (b). Such measurements shall provide valid data points for the range of wind speeds, wind directions, times of day and power generation requested by the Local Planning Authority. In specifying such conditions the Local Planning Authority shall have regard to those conditions which were most likely to have prevailed during times when the complainant alleges there was disturbance due to noise.

(b) Valid data points are those that remain after all periods during rainfall have been excluded. Rainfall shall be assessed by use of a rain gauge that shall log the occurrence of rainfall in each 10-minute period concurrent with the measurement periods set out in Note 1(c) and is situated in the vicinity of the sound level meter.

(c) Data points considered valid in accordance with Note 2(b) shall be plotted against the corresponding wind speed value determined in accordance with Note 1(d). A least squares, “best fit” curve of 2nd order shall be fitted to the data. In the event that this is a poor fit to the data, a higher (maximum 4th) order polynomial or data binning can be used. The noise level at each integer speed shall be

derived from this best-fit curve, or the relevant data bin, as appropriate.

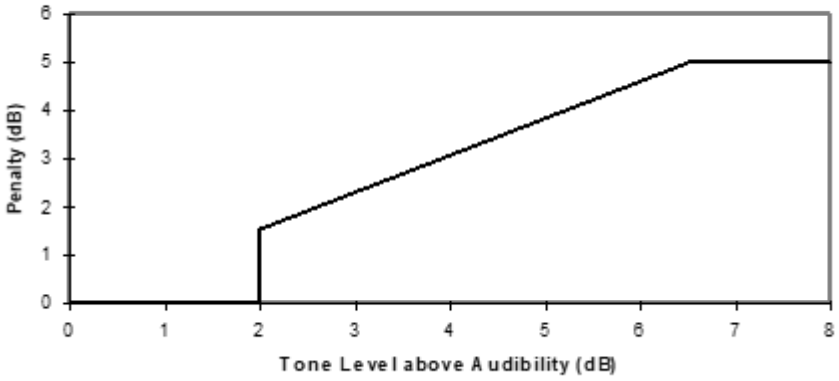
Note 3
Where, in the opinion of the Local Planning Authority, noise immissions at the location or locations where assessment measurements are being undertaken contain a tonal component, the following rating procedure shall be used.

(a) For each 10-minute interval for which LA90,10min data have been obtained as provided for in Notes 1 and 2, a tonal assessment shall be performed on noise immissions during 2-minutes of each 10-minute period. The 2-minute periods shall be regularly spaced at 10-minute intervals provided that uninterrupted clean data are available. Where clean data are not available, the first available uninterrupted clean 2 minute period out of the affected overall 10 minute period shall be selected. Any such deviations from standard procedure, as described in Section 2.1 on pages 104-109 of ETSU-R-97, shall be reported.

(b) For each of the 2-minute samples the margin above or below the audibility criterion of the tone level difference, ΔLtm (Delta Ltm), shall be calculated by comparison with the audibility criterion, given in Section 2.1 on pages 104-109 of ETSU-R-97.

(c) The arithmetic average margin above audibility shall be calculated for each wind speed bin where data is available, each bin being 1 metre per second wide and centred on integer wind speeds. For samples for which the tones were below the audibility criterion or no tone was identified, a value of zero audibility shall be substituted.

(d) The tonal penalty shall be derived from the margin above audibility of the tone according to the figure below. The rating level at each wind speed shall be calculated as the arithmetic sum of the wind farm noise level, as determined from the best-fit curve described in Note 2, and the penalty for tonal noise.



Note 4

If the wind farm noise level (including the application of any tonal penalty as per Note 3) is above the limit set out in the conditions, measurements of the influence of background noise shall be made to determine whether or not there is a breach of condition. This may be achieved by repeating the steps in Notes 1 & 2 with the wind farm switched off in order to determine the background noise, L3, at the assessed wind speed. The wind farm noise at this wind speed, L1, is then calculated as follows, where L2 is the measured wind farm noise level at the assessed wind speed with turbines running but without the addition of any tonal penalty:

$$L_1 = 10\log\left[10^{L_2/10} - 10^{L_3/10}\right]$$

The wind farm noise level is re-calculated by adding the tonal penalty (if any) to the wind farm noise.

TABLE OF NOISE LIMITS RELATING TO CONDITION 1

Table 1: The LA90,10min dB Wind Farm Noise Level Between 23:00 and 07:00 hours:

House ID	Reference Wind Speed, Standardised v10 (ms-1)											
	1	2	3	4	5	6	7	8	9	10	11	12
H1	42.9	42.9	42.9	42.9	42.7	42.4	42.2	42.3	42.3	45.9	45.9	45.9
H2	43.0	43.0	43.0	43.0	42.9	42.8	42.8	42.8	42.8	43.3	46.7	50.4
H3	43.0	43.0	43.0	43.0	42.9	42.8	42.8	42.8	42.8	43.3	46.7	50.4

House ID	Reference Wind Speed, Standardised v10 (ms-1)											
	1	2	3	4	5	6	7	8	9	10	11	12
H4	42.9	42.9	42.9	42.9	42.7	42.3	42.1	42.2	42.2	45.8	45.8	45.8
H5	43.0	43.0	43.0	42.9	42.9	42.7	42.6	42.7	42.7	43.2	46.7	50.3
H6	43.0	43.0	43.0	43.0	42.9	42.8	42.8	42.8	42.8	43.3	46.7	50.4
H7	42.9	42.9	42.9	42.9	42.7	42.3	42.1	42.3	42.3	45.9	45.9	45.9
H8	42.7	42.7	42.7	42.5	41.8	39.9	38.3	39.2	39.2	44.8	44.8	44.8
H9	43.0	43.0	43.0	43.0	43.0	42.9	42.9	42.9	42.9	43.2	43.2	43.2
H10	43.0	43.0	43.0	43.0	43.0	42.9	42.9	42.9	42.9	43.2	43.2	43.2
H11	43.0	43.0	43.0	43.0	43.0	42.9	42.9	42.9	42.9	43.2	43.2	43.2
H12	43.0	43.0	43.0	43.0	43.0	42.9	42.9	42.9	42.9	43.2	43.2	43.2
H13	43.0	43.0	43.0	43.0	43.0	42.9	42.9	42.9	42.9	43.2	43.2	43.2
H14	43.0	43.0	43.0	42.9	42.8	42.6	42.6	42.6	42.6	43.2	46.6	50.3
H15	43.0	43.0	43.0	42.9	42.8	42.6	42.5	42.5	42.5	43.1	46.6	50.3
H16	43.0	43.0	43.0	43.0	43.0	42.9	42.9	42.9	42.9	43.2	43.2	43.2
H17	43.0	43.0	43.0	43.0	43.0	42.9	42.9	42.9	42.9	43.2	43.2	43.2
H18	43.0	43.0	43.0	42.9	42.8	42.7	42.6	42.6	42.6	43.2	46.7	50.3
H19	43.0	43.0	43.0	43.0	43.0	42.9	42.9	42.9	42.9	43.2	43.2	43.2
H20	42.9	42.9	42.9	42.8	42.5	41.9	41.5	41.7	41.7	44.0	47.5	51.0
H21	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.3	43.3	43.3
H22	45.0	45.0	45.0	44.9	44.9	44.7	44.6	44.7	44.7	44.7	44.7	44.7
H23	45.0	45.0	45.0	45.0	45.0	44.9	44.9	44.9	48.3	52.4	52.4	52.4
H24	42.9	42.9	42.9	42.9	42.7	42.2	42.0	42.2	42.2	42.2	42.2	42.2
H25	42.9	42.9	42.9	42.9	42.7	42.4	42.2	42.3	42.3	42.3	42.3	42.3
H26	42.9	42.9	42.9	42.8	42.5	41.9	41.6	41.8	41.8	41.8	41.8	41.8
H27	42.9	42.9	42.9	42.9	42.7	42.4	42.3	42.4	42.4	42.4	42.4	42.4
H28	42.9	42.9	42.9	42.9	42.7	42.4	42.3	42.4	42.4	42.4	42.4	42.4
H29	43.0	43.0	43.0	43.0	42.9	42.8	42.8	42.8	42.8	42.8	42.8	42.8
H29	43.0	43.0	43.0	43.0	42.9	42.8	42.8	42.8	42.8	42.8	42.8	42.8
H30	43.0	43.0	43.0	43.0	42.9	42.8	42.8	42.8	42.8	44.7	47.8	51.2
H31	43.0	43.0	43.0	43.0	42.9	42.8	42.8	42.8	42.8	44.7	47.8	51.2
H32	43.0	43.0	43.0	42.9	42.8	42.6	42.5	42.6	42.6	42.6	42.6	42.6
H33	43.0	43.0	43.0	43.0	42.9	42.8	42.8	42.8	42.8	44.7	47.8	51.2
H34	43.0	43.0	43.0	42.9	42.8	42.6	42.5	42.6	42.6	42.6	42.6	42.6
H35	43.0	43.0	43.0	42.9	42.8	42.7	42.6	42.6	42.6	42.6	42.6	42.6
H36	43.0	43.0	43.0	43.0	43.0	42.9	42.9	42.9	42.9	42.9	42.9	42.9

House ID	Reference Wind Speed, Standardised v10 (ms-1)											
	1	2	3	4	5	6	7	8	9	10	11	12
H37	43.0	43.0	43.0	43.0	43.0	42.9	42.9	42.9	42.9	42.9	42.9	42.9
H38	43.0	43.0	43.0	43.0	42.9	42.8	42.7	42.8	42.8	42.8	42.8	42.8
H39	43.0	43.0	43.0	43.0	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9
H40	43.0	43.0	43.0	43.0	43.0	42.9	42.9	42.9	45.4	51.8	51.8	51.8
H41	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	51.8	51.8	51.8
H42	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	51.8	51.8	51.8
H43	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	51.8	51.8	51.8
H44	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	51.8	51.8	51.8
H45	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	51.8	51.8	51.8
H46	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	51.8	51.8	51.8
H47	43.0	43.0	43.0	42.9	42.8	42.6	42.4	42.5	42.5	43.1	46.6	50.3
H48	42.9	42.9	42.9	42.8	42.6	42.2	41.9	42.1	42.1	44.2	47.6	51.1

Table 2: LA90,10min dB Wind Farm Noise Level at all other times:

House ID	Reference Wind Speed, Standardised v10 (ms-1)											
	1	2	3	4	5	6	7	8	9	10	11	12
H1	37.5	37.5	37.5	37.5	37.5	37.5	37.5	38.9	40.4	43.6	46.8	46.8
H2	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	39.5	42.0	45.0	45.0
H3	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	39.5	42.0	45.0	45.0
H4	37.5	37.5	37.5	37.5	37.5	37.5	37.5	38.9	40.2	43.5	46.8	46.8
H5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	39.3	41.8	44.9	44.9
H6	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	39.5	42.0	45.0	45.0
H7	37.5	37.5	37.5	37.5	37.5	37.5	37.5	38.9	40.3	43.5	46.8	46.8
H8	37.5	37.5	37.5	37.5	37.2	36.4	36.4	33.5	33.2	41.5	46.0	46.0
H9	37.5	37.5	37.5	37.5	37.5	38.3	40.5	43.1	46.2	49.4	52.9	56.6
H10	37.5	37.5	37.5	37.5	37.5	38.3	40.5	43.2	46.2	49.4	52.9	56.6
H11	37.5	37.5	37.5	37.5	37.5	38.3	40.5	43.2	46.2	49.4	52.9	56.6
H12	37.5	37.5	37.5	37.5	37.5	38.3	40.5	43.2	46.2	49.4	52.9	56.6
H13	37.5	37.5	37.5	37.5	37.5	38.3	40.5	43.1	46.2	49.4	52.9	56.6
H14	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	39.2	41.7	44.9	44.9
H15	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	39.0	41.6	44.8	44.8
H16	37.5	37.5	37.5	37.5	37.5	38.3	40.5	43.2	46.2	49.4	52.9	56.6
H17	37.5	37.5	37.5	37.5	37.5	38.3	40.5	43.2	46.2	49.4	52.9	56.6
H18	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	39.2	41.8	44.9	44.9

House ID	Reference Wind Speed, Standardised v10 (ms-1)											
	1	2	3	4	5	6	7	8	9	10	11	12
H19	37.5	37.5	37.5	37.5	37.5	38.3	40.5	43.2	46.2	49.4	52.9	56.6
H20	37.5	37.5	37.5	37.5	37.5	37.5	37.5	38.2	38.1	41.9	45.2	45.2
H21	37.5	37.5	37.5	37.5	37.5	38.3	40.6	43.2	46.2	49.4	52.9	56.6
H22	45.0	45.0	45.0	44.9	44.9	44.8	44.8	44.8	44.7	44.7	44.7	44.7
H23	45.0	45.0	45.0	45.0	45.0	45.0	47.3	50.1	52.9	55.8	58.7	61.5
H24	37.5	37.5	37.5	37.5	37.5	37.5	37.6	38.9	38.7	41.0	41.0	41.0
H25	37.5	37.5	37.5	37.5	37.5	37.5	37.6	38.9	39.0	41.2	41.2	41.2
H26	37.5	37.5	37.5	37.5	37.5	37.5	37.6	38.3	37.8	40.5	40.5	40.5
H27	37.5	37.5	37.5	37.5	37.5	37.5	37.6	38.9	39.2	41.3	41.3	41.3
H28	37.5	37.5	37.5	37.5	37.5	37.5	37.6	38.9	39.2	41.3	41.3	41.3
H29	37.5	37.5	37.5	37.5	37.5	37.5	37.6	38.9	40.1	41.9	41.9	41.9
H30	37.5	37.5	37.5	37.5	37.5	37.5	37.5	38.5	40.3	42.9	45.7	45.7
H31	37.5	37.5	37.5	37.5	37.5	37.5	37.5	38.5	40.3	42.9	45.7	45.7
H32	37.5	37.5	37.5	37.5	37.5	37.5	37.6	38.9	39.6	41.6	41.6	41.6
H33	37.5	37.5	37.5	37.5	37.5	37.5	37.5	38.5	40.3	42.9	45.7	45.7
H34	37.5	37.5	37.5	37.5	37.5	37.5	37.6	38.9	39.6	41.6	41.6	41.6
H35	37.5	37.5	37.5	37.5	37.5	37.5	37.6	38.9	39.7	41.6	41.6	41.6
H36	37.5	37.5	37.5	37.5	37.5	37.5	37.6	38.9	40.2	42.0	42.0	42.0
H37	37.5	37.5	37.5	37.5	37.5	37.5	37.6	38.9	40.2	42.0	42.0	42.0
H38	37.5	37.5	37.5	37.5	37.5	37.5	37.6	38.9	40.0	41.8	41.8	41.8
H39	37.5	37.5	37.5	37.5	37.5	37.5	37.6	38.9	40.2	41.9	41.9	41.9
H40	37.5	37.5	37.5	37.5	37.5	38.0	42.1	46.5	51.0	55.3	59.3	62.8
H41	37.5	37.5	37.5	37.5	37.5	38.0	42.1	46.5	51.0	55.3	59.3	62.8
H42	37.5	37.5	37.5	37.5	37.5	38.0	42.1	46.5	51.0	55.3	59.3	62.8
H43	37.5	37.5	37.5	37.5	37.5	38.0	42.1	46.5	51.0	55.3	59.3	62.8
H44	37.5	37.5	37.5	37.5	37.5	38.0	42.1	46.5	51.0	55.3	59.3	62.8
H45	37.5	37.5	37.5	37.5	37.5	38.0	42.1	46.5	51.0	55.3	59.3	62.8
H46	37.5	37.5	37.5	37.5	37.5	38.0	42.1	46.5	51.0	55.3	59.3	62.8
H47	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	39.0	41.6	44.8	44.8
H48	37.5	37.5	37.5	37.5	37.5	37.5	37.5	38.5	38.9	42.2	45.3	45.3
H1	37.5	37.5	37.5	37.5	37.5	37.5	37.5	38.9	40.4	43.6	46.8	46.8

TABLE OF COORDINATE LOCATIONS OF PROPERTIES

Note to Table 3: The geographical co-ordinates references are provided for the purpose of identifying the general location of dwellings to which a given set of noise limits applies

Table 3: Coordinate locations of the properties listed in Table 1 & 2.

House ID	Co-ordinates		House ID	Co-ordinates	
	X (m)	Y (m)		X (m)	Y (m)
H1	330832	577322	H25	330609	581523
H2	332770	577352	H26	328925	581617
H3	332781	577360	H27	330754	581685
H4	330757	577391	H28	330762	581685
H5	332137	577508	H29	332510	581700
H6	332856	577577	H30	327254	582237
H7	331091	577580	H31	327187	582283
H8	329294	577858	H32	330464	582286
H9	334491	577916	H33	327247	582289
H10	334779	577933	H34	330450	582298
H11	334796	577936	H35	330609	582317
H12	334850	577938	H36	331756	582394
H13	333887	578115	H37	331768	582395
H14	332204	578349	H38	330396	582629
H15	332018	578373	H39	331480	582822
H16	334764	578390	H40	333704	583887
H17	334576	578584	H41	335066	583910
H18	332392	578594	H42	335203	583920
H19	334390	579396	H43	333905	583974
H20	327603	580990	H44	333903	583987
H21	336483	581006	H45	334314	584092
H22	331145	581155	H46	334354	584143
H23	332823	581273	H47	331972	578440
H24	330429	581507	H48	326899	580144