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Objection to Planning Application 2013/7182/P: Flat 1, 15 Wedderburn Road NW3 5QS

Dear Sir,

I have grave concerns about this application from the point of view of trees affected by the work and the underlying hydrogeology. My interest in the hydrogeology stems from its eventual effect upon trees: if buildings move as a result of basement work undertaken when the underlying hydrogeology is not understood, insurance companies blame trees. I am also concerned about local flooding. This is quite apart from the devastating effect on neighbours' property; neighbours who are already exceedingly concerned about this proposal.

In the BIA, 2.4 Geology, the position of 15 Wedderburn Road (starred) is shown significantly further north on the corner of Lyndhurst Road and Akenside Road, over the Shepherd Stream and close to the site of the old Shepherd Well. In the report below the following is stated: "The boundary between the Claygate Member and London Clay is shown approximately 150 m to the south of the site." The position of the star makes it appear that 15 Wedderburn Road sits in the centre of the Claygate Beds – between the Bagshot sands and the upper reaches (band D) of the London Clay Formation (LCF); a completely wrong impression. While 15 Wedderburn Road and all houses and services around it may be glad that a deep silt-walled basement is not being built over an old stream, in fact it is close to the spring line between the Claygate Beds and LCF band D – just as worrying.

At the end of this section it is stated: "However, the contours and spot heights shown on the OS and geological maps would suggest that the Claygate Member extends to a depth of approximately 77.00 m OD, where it is in turn underlain by London Clay. Groundwater was measured at a depth of 5.00 m (86.70 m OD) at this nearby site, although this may not have represented an equilibrium level."

Since the house has been sited incorrectly this is of course inaccurate and explains why groundwater was found at 5m which puzzled Geotechnical and Environment Associates.

"Given the location of the headwaters of the Tyburn, it is likely that it was formed by springs issuing from within the interface of the Bagshot Formation and Claygate Member. Groundwater within the silty sandy clays of the Claygate Member is considered to be dominated by fissure flow. The absence of any significant sand bed horizons reduces the water bearing potential of the Claygate Member to that similar to the underlying London Clay."

This is patently nonsense as anyone who lives in the area knows, and as their own borehole results demonstrate. In any case there are insufficient boreholes which could be missing significant water in sand partings under pressure, as has been found elsewhere in Hampstead when digging into the Claygate Member, with disastrous results for the builders and for neighbouring houses.

"Due to the very low permeability of the London Clay, any groundwater flow will be at very low rates." This is repeated twice elsewhere in the document and demonstrates no understanding of the different LCF bands; this is describing bands C or B, not D as is here. Four of London's rivers begin from the groundwater flow in Hampstead – the right and left arms of the Fleet, the Westbourne, the Brent and here, the seeps, springs and small tributaries that form the upper reaches of the Tyburn, such as can be seen flowing openly through the basement of 4 Wedderburn Road.

"Published data for the permeability of the London Clay indicates the horizontal permeability to generally range between  $1 \times 10^{-10}$  m/s and  $1 \times 10^{-8}$  m/s, with an even lower vertical permeability. However, the Claygate Member is sandier in composition and permeability could be expected to be higher." Well I never!

"The direction of groundwater flow within the Claygate Member beneath the site is likely to be controlled by the local topography and therefore in a south and southwesterly direction... Wedderburn Road has not been identified as a street at risk of surface water flooding, specified in the London Borough of Camden (LBC) Planning Guidance CPG4 and therefore a flood risk assessment will not be required."

Far from it. Wedderburn Road may not be on Camden's 2003 flood list, but Lyndhurst Gardens flooded in 1975, with Belsize Lane that receives both run-off and ground water flow south and south-westerly from Wedderburn Road flooding in both 1975 and 2002.

"Historically the Tyburn River flowed approximately 100m west of the site." This information is taken from a very small scale map in 'Lost Rivers of London'. The Tyburn has a wide area of tributaries that flow into it, including from a spring at the site of Hampstead Town Hall, Shepherd Stream that flows between Fitzjohn's Avenue and Daleham Gardens and a tributary that flows through the semi-basement of 4 Wedderburn Road. This is not an argument for significant flowing water being out of harm's way.

The information and opinions given under 3.1.1. Subterranean (groundwater) Screening Assessment, clearly indicate the confusion of Geotechnical and Environment Associates:

- 1a. Is the site located directly above an aquifer?  
Answer: Yes. The Site is underlain by the Claygate Member of the London Clay Formation, which is designated as Secondary 'A' Aquifer by the Environment Agency, capable of supplying local water supplies and supporting small watercourses.
- 4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?  
Answer: No. The existing site is covered entirely by the existing building and hard-standing areas so will not increase the amount of hard covered surfaces. Site drainage will be directed to public sewer as ground conditions would not be suitable for a soakaway or similar SUDS based system.

This site already consists of a lot of hard standing, but it is proposed that virtually all trees – whose canopies would hold a lot of rainwater - be removed. To add insult to injury it is planned to divert ground water OUT of the ground and back into the sewerage system that is already not coping. If water under pressure is encountered this flow will be considerable – the opposite of SUDS - thus contributing to significant flooding 'downstream' during periods of high rainfall as occurred in 1975 and 2002. **This effect is reason enough to refuse this application; please do so.**

- 5. As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?  
Answer: No. The very lowly permeable nature of the Claygate Member strata is unsuitable for receiving discharge to ground. While of variable permeability, the Claygate Member which contains a secondary 'A' aquifer, can hardly be described as of 'very low permeability'. In any case the layer described as Made Ground but which is actually mainly Head is more permeable and makes up the ground receiving rainfall.

- 6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than, the mean water level in any local pond or spring line?  
Answer: No. There are no local ponds or spring lines present within 100m of the Site. This statement is inaccurate possibly partly due to the inaccurate siting of the house on the geological map. There is a spring line roughly 10-20 metres lower down the hill from the house, which means the basement will be cutting through this and potentially into sand partings with water under pressure. Providing a block to this flow will cause washing out of the silt and sand beneath the neighbouring houses and roadway foundations such as frequently happens in Hampstead, but which those living or working elsewhere in London are clearly not aware of. It may also block water to some trees and potentially drown others.

- 3.1.3.
  - 4. Will the proposed basement development result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?  
Answer: No
  - 6. Is the site in an area known to be at risk from surface water flooding such as South Hampstead, West Hampstead, Gospel Oak and Kings Cross, or is it at risk of flooding because the proposed basement is below the static water level of a nearby surface water feature? Answer: No
- Both these answers should be Yes. A serious oversight.

5.1. "The made ground generally extended to depths of 1.25 m (78.75 m OD) 1.00 m (76.31 m OD) and 1.70 m (75.71 m OD) in the boreholes and generally comprised brown sand clay with rare flint gravel and occasional fragments of brick, chalk and pottery."

This indicates the unfamiliarity of Geotechnical & Environment Associates with this area, as what they are deeming 'Made Ground' consists largely of redeposited Head: downslope solifluction and soil creep of Bagshot Sand and upper Claygate Member material, pushed downhill by glacial action (Ellison, 2004). Many slopes greater than 3° are covered with a veneer of Head which Culshaw and Crummy (1991) have suggested should be considered as potentially unstable. Boreholes 2 and 3 confirm this downslope solifluction since even the Claygate Member here contains flint gravel. **Such a degree of unfamiliarity with local geology and inadequate BIA warrants refusal.**

The borehole tests revealed quite a degree of standing water, perched and inflowing groundwater at various levels from 1.32m to 10m to a degree that this caused unsafe slumping preventing completion of the studies. Where is this water coming from if the ground is apparently of so "very low permeability"? How can they state, even with these insufficient boreholes that "it is not considered that the proposed basement would result in a significant change to the groundwater flow regime in the vicinity of the proposal or on the amount of annual recharge into the Claygate Member"?

The Boreholes were visited 3 times to assess ground water on 18<sup>th</sup> and 27<sup>th</sup> September 2013 and 9<sup>th</sup> October. These visits followed unseasonably dry periods:

Hampstead Rainfall, from: <http://nw3weather.co.uk/wxhistmonth.php>

2013	Total monthly rainfall	1971-2000 monthly averages
June	15.6 mm	28%
July	36.2 mm	86%
August	51.3 mm	97%
September	61.3 mm	108%

It is acknowledged that "Further groundwater monitoring should be carried out to establish equilibrium levels and the extent of any seasonal fluctuations. It would be prudent to carry out a number of trial excavations, to depths as close to the full basement depth to provide an indication of the likely groundwater conditions." This data should be part of the BIA to help inform decisions. Rainfall is widely fluctuating nowadays, so results obtained purely in dry periods is completely insufficient.

Boreholes 1 and 2 are roughly in line with ground flow. While the borehole plan is not to scale, it is clear that a river about 15 metres wide could flow unknowingly between boreholes 2 and 3. In this area of Claygate Beds very close to the spring line, where sand partings containing water under pressure are quite possible, several of these could be flowing through this plot that will be encountered by basement digging but not picked up by the boreholes dug to date.

Considering the very close proximity of number 13 Wedderburn Road's foundations, it is very clear that the data presented, including the siting errors, is far from sufficient as a BIA in order to confirm the risk of harm to the neighbours. From my point of view I also do not wish to see building movement that trees are blamed for in the future.

I am also very concerned that such a large degree of tree canopy be totally removed, and a significant area of garden reduced preventing future tall trees with significant canopy. This whole proposal will have a major impact on the treescape at such a key corner site. **Please refuse.**

**Dr Vicki Harding, Voluntary Tree Officer, Heath & Hampstead Society**

Culshaw MG & Crummy JA (1991) British Geological Survey Technical Report, WN 90/2.  
 Ellison RA (2004) Geology of London: Special Memoir for 1:50 000 Geological sheets. British Geological Survey, Keyworth.

Tim de Faulx's Report No 26 Wedderburn Rd

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The proposed basement excavation at 26 Wedderburn Road puts at risk the stability of the foundations of this property which are shared by the owner occupiers of the upper level flats. As the excavation is in some part adjacent to and parallel to the flank wall of no 24 it also exposes the owners of that property to an unacceptable level of risk

The main risk arises from exposure to, during excavation, the high and indeterminate nature of the water table and it's rate of flow through the claygate beds on which the building is founded

The trial bores taken at the site encountered the water table some 2-3 m above the proposed basement level 1.5 -2.5 m above the existing basement level.

The water lies in the permeable clay gate beds which overly the london clay which was found 3-4 m below the existing basement level. The claygate beds and the london clay slope in the same direction as the ground level , typically in a North East to South West direction

The rate at which the water travels through the clay gate bed can vary depending on the size and frequency of sand and gravel lenses present at any location, the amount of ground water feeding this aquifer and the inclination of the impervious layer over which the water travels

It would be impossible without exploring every inch of the proposed excavation to determine where these lenses occur. Therefore the dynamic head of water that is likely to be met during excavation in the vicinity of these watercourses is unmeasurable and unpredictable.

The excessive quantity of rain in the last few months should serve as a warning that the quantity and flow rate of water through the water bearing layers can vary dramatically causing erosion of underground soil strata and in some cases total collapse of the ground as reported in the national press during the recent extreme weather. The basement of 26 Wedderburn Road has suffered flooding on many occasions in the past confirming the ever present threat form the high water table surrounding it.

The proposal as it stands suggest excavating some 1000 mm below the underside of the existing foundations and underpinning them with concrete in a sequential fashion. This could not be done without water pouring into the basement with possible serious erosion of soil below the existing foundations of No 26 and where close to the boundary wall the foundations of No 24. In order to address this problem a proposal has been made to inject grout into the claygate bed to prevent water travelling through the sand and gravel lenses.

There is no realistic way of determining whether or not the grout will have penetrated the soil sufficiently to create an effective seal and inundation of the excavation with erosion of the existing foundation material could be a very real scenario seriously threatening the stability of both no 26 and 24.

It should be noted that the elevation of the underside of the foundations to No. 24 is not known and cannot be easily determined due to lack of access. As a consequence there could be a substantial surcharge on the soil adjacent to an underpin section which could seriously contribute to a local collapse of the soil below the foundations.

It should also be understood that access to this site is limited and the equipment used for removing and replacing material is likely to be by wheelbarrow. Excavation of the basement to create the reduced level would require the removal of up to 70 cubic meters of soil and the import of 45 cubic meters of concrete. Typically it takes 15 wheelbarrow trips to place 1 m<sup>3</sup> of concrete so there would need to be over 1050 trips just to get the soil out and a further 680 trips to bring the concrete in. In addition the underpinning work has to be carried out in a limited sequential fashion all of which leads us to conclude there is a clear

**Jo Konrad**

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**From:** Tim Macfarlane <tm@glasslimited.eu>  
**Sent:** 19 January 2014 12:48  
**To:** Jo Konrad  
**Cc:** Liz Pether  
**Subject:** RE: Report



Hi Jo,

Please find attached the corrected report  
The Claygate layer which occurs approximately between levels 78 OD and 74 OD is considered a secondary A aquifer – this is identified in the soil report  
It is a water bearing strata and excavations through this layer will need to be protected against water inflow.

Extract from soil Report:

### 2.5 Hydrology and Hydrogeology

The Claygate Member is classified by the Environment Agency as a Secondary 'A' Aquifer, defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers, however, this classification is based on the presence of saturated sand bed horizons within the Claygate member  
The London Clay is classified as 'Unproductive Strata', as defined by the Environment Agency as rock or drift deposits with low permeability that have negligible significance for water supply or river base flow.

There are no Environment Agency designated Source Protection Zones (SPZs) on the site. The nearest surface water feature is located 790 m northeast of the site. The site lies outside the catchment of the Hampstead Heath chain of ponds.

Groundwater is likely to be present within the Claygate Member, and other investigations carried out around the area of Hampstead Heath indicate that spring lines, reflecting the presence of perched groundwater, are present at the interface of the Bagshot Beds and the Claygate Member, and at a lower level at the boundary between the Claygate Member and the underlying essentially impermeable London Clay. These springs have been the source of a number of London's "lost" rivers, notably the Fleet, Westbourne and Tyburn, which all rose on Hampstead Heath, to the south and southwest of the current site, at the base of the Bagshot Beds.

Best  
Tim

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**Jo Konrad**

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**From:** Tim Macfarlane <tm@glasslimited.eu>  
**Sent:** 17 March 2014 17:22  
**To:** Elizabeth Pether  
**Cc:** Jo Konrad; Iqbal Bundhun  
**Subject:** RE: 15 Wedderburn Road

③

Liz,

Everything is good thank you.

In your case the design intention is to use secant piling to hold back the ground water and support the adjacent foundations. This is a well understood technique and would be an acceptable method if they can get a suitable rig inside the building!

In the case of No 26 there is not enough space to be able to get a rig inside the basement to install secant piling so they are proposing an injected grout solution instead. The objection to the works in No. 26 going ahead are based on arguing that the penetration of the grout is unpredictable and indeterminable so poses a higher risk to inundation from the ground water/Aquifer.

I would think forwarding my comments re 26 would do no harm but the objection to the works in your case is based on the massive disruption caused by the extent of the works and the impracticality of carrying out the excavation without major disturbance and access issues for you living above the works and Jo living adjacent to them

Best  
Tim

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**From:** Elizabeth Pether [<mailto:petherelizabeth@yahoo.co.uk>]  
**Sent:** 17 March 2014 16:29  
**To:** Tim Macfarlane  
**Cc:** Jo Konrad; Iqbal Bundhun  
**Subject:** 15 Wedderburn Road

Tim  
Trust all is well with you.

As you know we are well aware of your inputs into the proposals at 26 Wedderburn Road and have been studying them with great interest. Do your most recent comments apply equally to 15 ie re water/stability of buildings? If so would it be acceptable to you if we also forwarded them to the planning officer dealing with the application for 15?

Very much appreciate your view on this

Thank you

Liz Pether

Jo Konrad

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**From:** Tim Macfarlane <tm@glasslimited.eu>  
**Sent:** 05 March 2014 14:03  
**To:** Elizabeth Pether  
**Cc:** Jo Konrad  
**Subject:** Re: 15 Wedderburn Road



Hi Liz

They have not provided sufficient detail on the revised drawings to assess the disruption to your entrance, the lift and the parking. I assume from their revised drawing that they will pull the piling inside the line of the front wall over the parking bay and come round the base of the lift again on the inside. We should ask for clarification.

Best Regards

Tim

Sent from my iPhone

On 5 Mar 2014, at 13:15, "Elizabeth Pether" <petherelizabeth@yahoo.co.uk> wrote:

Tim

Thanks for your email and comments. However I specifically asked whether you think that the lift and our staircase will not be compromised by piling immediately adjacent to the former and under the later. Would really appreciate your advice on this.

Thanks

Liz



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**Jo Konrad**

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**From:** Jo Konrad <jo@jokonrad.com>  
**Sent:** 19 January 2014 12:41  
**To:** jo@jokonrad.com  
**Subject:** FW: !5 Wedderburn Road  
**Attachments:** Planning Application 2013 7182 P Response.docx

Dear Liz, Jo,

I have updated my report to include all of your comments so hopefully it is good to go.

The piling rig that was recommended in their report may well be available from another company but that would be up to them to demonstrate and all we can say at this stage is that they have not done that in that the company that they have recommended is in liquidation- in any case they did not describe how a minimal headroom rig can install the pile as a continuous operation which would be necessary to create the secant pile through water bearing strata. A continuous flight auger typically has to have the same headroom as the length of pile being installed. A rig with limited headroom would have to use a segmented continuous flight auger if there is such a rig. They may be able to come up with a solution to this problem but as yet they have not demonstrated how.

I think in any case our main line of argument is that the development is unsustainable in accordance with the National planning guidelines.

Best Regards

Tim

**Tim Macfarlane**

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