17. Residual Effects

17.1 This Chapter summarises the residual effects of the Proposed Development under each topic examined in the ES after mitigation measures have been taken into account. The Chapter has been prepared by Turley Associates.

Demolition and Construction

17.2 The demolition and construction phase of the Proposed Development would by definition, be temporary and would not therefore cause any residual effects. Measures would be undertaken to minimise the effects of demolition and construction and as discussed throughout the ES.

Socio Economic Effects

17.3 There are no significant adverse environmental effects arising from the Proposed Development in socio-economic terms. On this basis, as the effects of the Proposed Development are predominantly beneficial, there is no requirement for mitigation. As no mitigation is required, the residual effects would be the same as the potential effects described in Chapter 7: Socio Economic Effects.

Transportation and Accessibility

17.4 The residual effects of the Proposed Development would be as follows.

Demolition and Construction

17.5 Prior to the commencement of demolition on site, a detailed demolition and construction programme would be prepared and this would include a management plan that would ensure the construction traffic only uses suitable routes and junctions at suitable time to access the Site. As a result the effect of demolition and construction traffic is minimised and the residual effect is therefore classed as **Negligible**.

Operational Development

Pedestrians and Cyclists

17.6 The existing bridge across the River Churnet, which is accessed via Abbey Green Road, would serve as the main pedestrian and cycle access into the Site. The

bridge utilises its strategic location on the local cycle route network as well as the anticipated pedestrian desire line from the town centre to provide a convenient route into the development from the surrounding residential areas and the town centre.

17.7 A signal-controlled pedestrian crossing at Macclesfield Road is also proposed. Located in a strategically located position between the junctions of Belle Vue Road and Abbey Green Road it provides connections to the Site with the residential areas south of Macclesfield Road.

17.8 It is proposed to provide each element of the development with cycle parking provision in appropriate locations that would serve to encourage cycling as a mode of transport to the development.

17.9 The proposed Travel Plan for the development would actively encourage visitors to the development to travel on foot and by bike, and would promote the benefits of doing so as well as offering incentives where appropriate.

17.10 These proposals would offer an improved pedestrian and cycle friendly environment and the residual effect for both issues is therefore classed as **Minor Beneficial**.

Public Transport

17.11 A key part of the Proposed Development is the introduction of a new shuttle bus service that would further enhance the links between the development, town centre and surrounding residential areas. The details of the bus service remain under negotiation and consideration between the developer, the local highway authority and a local bus operator, but it is considered that the service would provide a significant benefit to the public transport services within Leek and would serve to integrate the site with the town centre. A dedicated bus stop and shelter is proposed within the Site and would be located in a strategic position in close proximity to the supermarket.

17.12 The proposed Travel Plan for the development would actively encourage visitors to the development to travel by public transport, and would promote the benefits of doing so as well as offering incentives where appropriate.

17.13 The shuttle bus service would provide a substantial benefit to visitors to the development and the town centre by public transport and the residual effect is therefore classed as **Substantial Beneficial**.

Servicing Strategy and Management

17.14 The TA provides a comprehensive strategy of how the service yards would operate and be managed with the creation of formal management plans, and this ensures that the effect of the servicing traffic is kept to a minimum and the residual effect remains as **Negligible**.

Highway Network

17.15 The proposed main vehicular access for the development is in the form of a three-arm roundabout junction on Macclesfield Road that provides the most appropriate form of junction to ensure that traffic along Macclesfield Road continues to travel freely.

17.16 As there is limited potential at all three existing junctions for improvements to be made, it is beyond the control of the developer to resolve the resultant issues. However, SCC is in the process of developing a Draft Transport Strategy for Leek that, instead of looking for developers to resolve local transport issues separately, will seek financial contribution towards an area-wide improvement that will be presented in the forthcoming strategy.

17.17 It is clear that the junctions affected by the development proposals would be key considerations within the forthcoming strategy and so it is considered appropriate that the developer would help to initiate the strategy with a suitable financial contribution based on the predicted effects that the development would have on the junctions. It is anticipated that this financial contribution could be secured via a Section 106 agreement between the developer and SCC following the grant of planning permission.

17.18 It is understood that SCC is in the final stages of developing a microsimulation model of the traffic in Leek that will help to inform area wide effects of development and/or transport improvements. As such it is considered appropriate that the effect of the Proposed Development's traffic is assessed within the microsimulation model, and will inform financial contribution negotiations.

17.19 It is considered that the contribution strategy would lead to improved transport networks in Leek and thus the residual effect is classed as **Moderate Beneficial**.

Ecology

17.20 With the implementation of the mitigation measures, the residual effects on local ecology during both the demolition and construction phase and the operational

phase would be **negligible (or absent)** with the exception of water voles and otters, which would experience a **minor beneficial** effect in the long-term as a result of habitat improvements to the River Churnet.

17.21 The residual effects are largely concentrated during the demolition and construction phase and specifically are as follows.

Demolition and Construction

17.22 There may be disturbance to the river bed of the River Churnet leading to the release of debris and particles and potential temporary damage to invertebrate habitat. The mitigation measures proposed seek to minimise the removal of bank-side vegetation and consequent loss of habitat.

17.23 There is likely to be minimal noise and disturbance as a result of contractors, including dust from construction activities and light pollution from night-time construction activities (**negligible magnitude, negligible significance**).

17.24 There would be the removal and replacement of Hedgerows 2 and 3 (**substantial adverse magnitude, negligible significance**) and there would be minimal noise and disturbance as a result of the contractors (**negligible magnitude, negligible significance**).

17.25 There would be minimal disturbance to the foraging and commuting of badgers during this period (**negligible magnitude, negligible significance**).

17.26 The mitigation measures result in low potential to disturb individual roosting bats under the supervision of a licensed bat worker. Noise and lighting would have a minimal disturbance to foraging and commuting bats (**negligible magnitude, negligible significance**).

17.27 There would be minimal damage to/or removal of water vole foraging habitat and minimal noise and disturbance to water vole and otter habitats as a result of contractors (**negligible magnitude, negligible significance**).

17.28 Reptiles would be disturbed during translocation but this is considered to be of **negligible magnitude** and **negligible significance**.

17.29 In terms of breeding birds, the reduction in area of suitable foraging, nesting and resting habitats would have a **negligible magnitude, negligible significance**.

17.30 There are no residual effects in terms of trees.

Operational Development

17.31 The residual effects to the River Churnet are **negligible magnitude, negligible significance** and are as follows:

- Minimal increase in risk of pollutants and contaminants from run-off;
- Minimal increase in light pollution;
- Minimal severance of tree-lined corridor of the river;
- Increased shading of river and bank side vegetation;
- Increased litter and debris entering the waterway;
- Increased disturbance to habitats and species;
- Creation of a more natural profile to the river banks;
- Provide new vegetated wetland habitat;
- Enhance the quality of the river as a green corridor; and
- Reduce the quantity of debris in the river.

17.32 Due to the proposed public open space, there would be an increase in use and this would potentially increase litter and debris, disturbance to habitats and species, and damage to the retained hedgerow and associated vegetation. Further to the proposed mitigation measures this is considered to have **negligible magnitude, negligible significance**. Similarly trees are potentially at risk of damage from increased visitor pressure but this is also considered to be of a **negligible magnitude, negligible significance**.

17.33 The effect to badgers would be of **negligible magnitude** and **negligible significance**. The mitigation measures proposed minimise:

- Disturbance to foraging and/or resting badgers;
- Avoidance of commuting and/or foraging habitat as a result of increased visitor pressure;
- Increased risk of malicious activities towards badgers;
- Increased risk of road traffic accidents involving badgers;
- No net loss in foraging potential on site; and

- Creation of new foraging resources of seasonal importance.

17.34 The improvements to the water vole habitats in terms of foraging, commuting and nesting result in a **minor beneficial** effect both in terms of magnitude and significance.

17.35 Although there may be an increase in disturbance to foraging of reptiles and otters and/or basking reptiles and resting of otters, there would be provision of better quality reptile habitats and improved otter commuting/hunting habitat on site and this results in the residual effect being **negligible magnitude, negligible significance**.

17.36 Nesting birds may experience an increase in disturbance and increased predation as a result of cats however this is considered to be of **negligible magnitude, negligible significance**.

17.37 There are no residual effects in terms of bats.

Landscape and Visual Effects

Demolition and Construction

17.38 Effects during the demolition and construction phase are generally transient or short term, but some are permanent. The latter include vegetation clearance except where this is later mitigated by re-vegetation through planting or land management strategies.

Sensitivity Visual Receptors

17.39 Despite mitigation during construction, the majority of identified effects on high sensitivity receptors would remain adverse after mitigation during the construction phase, but the magnitude of the residual effects would be reduced in many cases by the mitigation recommended.

17.40 High Sensitivity Receptors close to the Application Site, namely Brindley Corn Mill SAM, the Grade II Listed Working Mens Club, the Grade II Listed Abbey Green Road Footbridge, would expect beneficial residual effects after mitigation, even during the construction phase.

17.41 Almost all medium sensitivity receptors would experience adverse effects during the construction phase even after mitigation, although these may be in cases only of low magnitude.

17.42 All low sensitivity receptors within the immediate vicinity of the Application Site would experience adverse effects during the construction phase even after mitigation.

Landscape Character

17.43 The existing landscape character of the Application Site would be greatly disrupted during the construction phase even after mitigation, but retention of existing trees and other vegetation would mitigate these residual effects. Edge of construction site vegetation and temporary hoardings would be important in reducing effects on the character of adjacent areas. Maintenance of river bank vegetation would be particularly important in maintaining fluvial character and water quality.

Operational Development

17.44 Tree and shrub planting and other mitigation are expected to be well established and provide effective mitigation within 10 years of completion of the development.

17.45 With the benefit of maturing new trees, shrubs and herbaceous vegetation within the completed development and the greater aesthetic appeal of the designed building finishes, most of the high sensitivity visual receptors would experience beneficial residual effects from the Proposed Development after mitigation. In the case of Brindley Mill SAM, the Grade II Listed Working Mens Club, and the Grade II Listed Abbey Road Footbridge, these effects are considered to be **high beneficial**. Only Nos 47-49 (Odd) Macclesfield Road and Leek Town Footpath No 6 between Highfield Hall Park (Bridge End) and Abbey Green are judged to still have **low adverse** effects after mitigation. In both these cases the residual effect magnitude is judged to be medium.

17.46 All medium and low sensitivity visual receptors are judged to have **beneficial** residual effects from the Proposed Development following mitigation.

Landscape Character

17.47 On maturity of the mitigation planting it is considered that the overall landscape character of the Application Site would be improved from that existing prior to construction. The residual effect after mitigation is considered to be **moderate beneficial**.

Archaeology

17.48 The successful implementation of the mitigation proposed would ensure that there are no adverse residual effects on the historic environment and archaeological resource from the Proposed Development. Mitigation would ensure that adverse effects are as a minimum **negligible**.

17.49 It can however be argued that the residual effect is **minor beneficial**. The Development provides an opportunity to investigate and record the potential remains, thus expanding knowledge of the historic environment and allow its dissemination, which would aid in the better understanding of the county's history and cultural heritage, while also contributing to local and regional research.

Noise and Vibration

Demolition and Construction

17.50 With the use of current Best Practice construction methods, the application for a Section 61 prior consent would: minimise the potential for disturbance from construction activities; promote communication with local residents with regard to any particularly noisy activities; and use quieter piling methods where applicable. It is predicted that the demolition and construction activities would have a **negligible** effect for residential properties surrounding the Application Site.

Operational Development

Service Yard Operations

17.51 The construction of a solid noise barrier around the rear boundary of the retail units service yard would be expected to reduce day time noise such that a **negligible** effect would arise. Restriction of night time deliveries would ensure that no adverse night time effect is caused.

17.52 The provision of suitable double glazing and mechanically assisted ventilation for rooms or properties in the proposed residential units facing the access road would ensure that no night time noise effect is caused. This however, is a matter to be dealt with in more detail in any subsequent detailed design of the residential units.

Supermarket Service Plant Noise

17.53 Generic mitigation in the form of appropriate siting of the service plant equipment and the use of acoustic louvres, if judged to be necessary, would ensure that **no adverse** effect arises from the operation of this equipment.

Suitability of Site for Residential Development

17.54 The assessment indicated that provision of double glazing and mechanically assisted ventilation for rooms or apartments facing Macclesfield Road, would ensure that **no adverse** noise effect was caused for future residents. This matter will be dealt with at the detailed design stage.

Air Quality

Demolition and Construction

17.55 Effective implementation of an Environmental Management Plan (EMP) and incorporation of mitigation measures for Non-Road Mobile Machinery (NRMM) would contribute to reducing the effect of demolition and construction emissions on sensitive receptors to **negligible**.

17.56 Although the final construction traffic route should endeavour to avoid narrow roads with a high proportion of roadside sensitive receptors, it is inevitable that some properties would be passed. As such, a **minor, localised and temporary adverse** effect on air quality is predicted at these locations.

Operational Development

17.57 Given the conservative approach to the dispersion modelling assessment, no mitigation measures are proposed, thus a **minor adverse** effect on local air quality is predicted. The assessment did not predict any exceedences of the respective Air Quality Objectives, with the Site considered suitable for residential use.

Flood Risk

Assessment of Flood Risk

17.58 The existing developed part of the Application Site is located within the EA Flood Zone 3a, the area of open space is within Flood Zone 3b. The Proposed

Development would result in an overall increase in hardstanding and roof areas, however as the PFS hardstanding and roof areas have not been included (discharging to foul sewer), there is a slight decrease of 1%.

17.59 It has been assessed that this would have no increased risk of flooding, and is therefore assessed as a **minor beneficial** effect.

Effect of Flooding on Site Access

17.60 Access to the Proposed Development would continue to be from Macclesfield Road, along with access to the residential units from Abbey Green Road.

17.61 The existing levels enable any overland flow to drain away from the Application Site access and building access. The proposed levels would significantly change the Application Site contours; this is due to the proposed levels being raised by approximately 3m to 4m across the majority of the Application Site, to remove the Proposed Development from Flood Zone 3a.

17.62 It is assessed that the effect of flooding on site access would be **negligible**.

Effect of Floodplain Storage

17.63 The Application Site is partially located within a flood plain; a Flood Compensation Area (FCA) is to be provided and therefore additional capacity can be provided.

17.64 It is assessed that the FCA would provide adequate storage for the Proposed Development and therefore results in a **minor beneficial** effect.

Effect of Flood Flows

17.65 The proposed changes to the River bed and embankment profiles are to be modelled and the existing flood flows would change, however it is expected that these changes would have no effect on the Proposed Development or the existing surrounding area.

17.66 It is assessed that the changes to the River bed and embankment would have a **minor beneficial** effect on the flood flows.

Effect of Surface Water Runoff

17.67 The Application Site is currently 57% hardstanding with a site run off of 177.9 l/s (1 in 100 year event). The proposed Application Site is expected to be 56%

impermeable (hardstanding/car parking not including the PFS) with a site run off of 128.2 l/s (1 in 100 year event) with the inclusion of the proposed SUDS methods, therefore there would be a decrease in surface water run off.

17.68 The decrease in surface water run-off would not be expected to increase the existing risk of flood from surface water run-off. This reduction in run-off is approximately 30% of the existing situation.

17.69 It is assessed that this would be result in a **substantial beneficial** effect.

Effect on River Environment

17.70 The works to be undertaken along the River Churnet: removal of canalised section, regrading, in specific areas of existing River bed, widening of existing River embankment and construction of a fish pass are expected to result in a **substantial beneficial** effect.

Ground Conditions

Demolition and Construction

Humans

17.71 Implementation of health and safety guidelines, environmental controls and best practice would remove the pathways of exposure to contaminants for construction workers and the general public, whereby there is a **minor beneficial** residual effect.

Soils/Ground

17.72 Implementation of a Construction Environmental Management Plan (CEMP) and pollution prevention guidance during construction phase would control storage and use of fuels and chemicals, thereby reducing the risk of pollution incidents. Any residual effects are therefore anticipated to be **minor beneficial**.

17.73 Remedial works are to be undertaken to the approval of the regulatory authorities to remove the potential risk of to human health and controlled water receptors.

17.74 The completion of the proposed remedial works, including removal of hotspot contaminated soils and industrial wastes where deemed unsuitable, and possible groundwater remediation, provides **minor beneficial** effect.

Groundwater

17.75 Implementation of a CEMP would minimise the potential release of contaminants into the underlying groundwater during demolition and remediation and additional groundwater monitoring would confirm the requirement for remedial works. Management of the groundwater quality would therefore have a **moderate beneficial** effect.

17.76 If a piled foundation solution is required for the Site, this would be carried out with due regard to EA guidance to minimise potential mobilisation of contaminants and ensure there was a **negligible** effect.

Surface Waters

17.77 CEMP implementation would include measures to prevent uncontrolled release to surface or foul water systems, or River Churnet, in conjunction with temporary drainage/cut-off trenches whereby a **minor beneficial** effect can be anticipated.

Sensitive Ecosystem

17.78 The Local Nature Reserve has been identified as the only sensitive ecosystem in the vicinity of the Application Site, and only one pathway has been identified during demolition and construction phase, related to fugitive dust emissions. The pathway can be controlled, thereby reducing the potential residual effect to **negligible**.

Operational Development

Humans

17.79 After development the residual risk from the presence of ground gases would be removed by the design of gas protection measures within the buildings based on the requirements of CIRIA C665 (Ref 15.30) leaving a residual **moderate beneficial** effect.

Soils/Ground

17.80 Potentially contaminative uses would occupy areas of the Proposed Development including possibly Portland Dye and the Sainsbury's PFS, both of which would be controlled by regulatory devices, reducing the contamination risk. The completed development would therefore have a **moderate beneficial** effect on soils/ground.

17.81 After remediation the quality of underlying soils would meet regulatory requirements. All industrial wastes would have been removed and within gardens and open landscaping clean capping cover would have been placed and validated. The completed development would remove risk from human receptors and would therefore have a **moderate beneficial** effect.

Groundwater

17.82 Removal of contamination hotspots, placement of clean cover capping materials, and construction of buildings and hardstandings would reduce infiltration of rainfall. There would therefore be a **minor beneficial** effect on groundwater quality following remediation and redevelopment.

Surface Waters

17.83 The removal of both significant contaminant sources and pathways for leachable contaminants, combined with the design of interceptors and other traps to the discharge of contaminated storm waters from car parks etc. creates a **minor beneficial** effect to surface waters post development.

Sensitive Ecosystem

17.84 As there are no pathways post development to link contamination on the Application Site to the Nature Reserve, a **negligible** effect is envisaged to this receptor.

Proposed Structures

17.85 Concrete classification, gas protection and water supply pipes would be designed to have **negligible** effect.