

River Itchen SSSI Impact Report

Background

This report details a response by Loco₂gen Ltd (the Agent) acting on behalf of Eastleigh Borough Council (the Applicant) to a request by Natural England for further information regarding the effects of a proposed embedded solar energy development (the 'Proposed Development') consisting of a c. 30MW solar farm to be located on unused agricultural land off Allington Lane, over 2km south east of Eastleigh, Hampshire.

The response from Natural England to planning consultation (V/23/95757) contained a request for further information to determine whether the Proposed Development will impact the interest features for which Itchen Valley SSSI has been notified.

This report will set out the following:

- The SSSI citation for River Itchen;
- Breakdown of potential impacts;
- Assessment of likely effects; and
- Conclusions.

The Applicant considers designated SSSI sites to be of great importance. The Planning Submission and early-stage environmental assessments will consider the potential impacts to both the local and wider environment.

The Planning, Design and Access Statement (PDAS) shall set out the extent of potential impacts on the interest features of the SSSI designation from the projects.

The PDAS and the supporting environmental assessments will thoroughly assess the SSSI within their impact assessments and measures to limit effects to the SSSI shall be described in detail. The following report provides an initial overview of the possible direct and indirect effects to the SSSI from the proposed development and highlights the most pertinent considerations to limit and negate its impacts.

River Itchen SSSI

The SSSI citation contains the principal features that the proposed development must consider when assessing potential impacts and effects. As the Itchen Valley is an area that features many different habitats, so an understanding of the ecological and hydrological features will be key in the assessment approach. The main description within the citation states:

"The Itchen typifies the classic chalk river and shows a greater uniformity in physical characteristics along its entire length than other rivers of this type. Since the river is mainly spring-fed, there is only a narrow range of seasonal variation in physical and chemical characteristics. The water is of high quality, being naturally base-rich and of great clarity; and its temperature is relatively constant, with dissolved oxygen levels at or near saturation. However, as in many lowland rivers, there is evidence of nutrient enrichment in parts of the system. The river's vegetation is dominated by higher plants, and the aquatic flora is exceptionally species-rich with many typical chalk stream plants present in abundance. The majority of these plants are present throughout the system and downstream changes are less than in most other rivers. The Itchen supports one of the few populations of the native white-clawed crayfish remaining in the rivers of southern England and breeding otters. The Itchen valley contains areas of fen, swamp and meadow supporting vegetation with diverse plant communities, some species-rich. These areas, together with semi-natural riparian vegetation bordering much of the river's courses, provide habitat for diverse invertebrate assemblages which include nationally-rare and scarce species, including aquatic molluscs.

The River Itchen has been modified over the centuries by provision of water-heads for mills and the irrigation of water meadows. These developments, in addition to the construction of the Itchen Navigation (now disused), have resulted in a multiplicity of water courses. The Itchen is world renowned for game fishing, largely provided by brown trout, both wild and stocked populations, and to a lesser extent salmon and sea trout. The river's channels and banks are regularly managed to maintain and facilitate the fishing, and this has contributed to its present character and appearance. In the Alresford area, near the headwaters of the Itchen, commercial cress growing is a substantial industry, and a number of commercial fish farms are located along the upper river. A small number of sewage treatment works also discharge into the river. Water for public and agricultural use is abstracted via boreholes from the river's aquifer as well as its channel. Traditional water meadow management has ceased, but the flood pasture, marsh and fen vegetation which developed on them is still present in those meadows not converted for modern intensive grass or arable production."

The Itchen also supports several Annex II protected species, which are a contributing factor for SSSI classification. Annex II species include:

- Southern damselfly *Coenagrion mercurial*
- White-clawed crayfish *Austropotamobius pallipes*
- Otter *Lutra lutra*
- Bullhead *Cottius gobbo*
- brook lamprey *Lampetra planeri*
- Atlantic salmon *Salmo salar*

The SSSI is also notified for supporting Water vole *Arvicola terrestris*, and its bird assemblages; bird species noted within the citation include tufted duck *Aythya fuligula*, pochard *A. ferina* and shoveler *Anas clypeata*, the waders lapwing *Vanellus vanellus*, redshank *Tringa totanus* and snipe *Gallinago gallinago*, and wetland passerines including sedge warbler *Acrocephalus schoenobaenus*, reed warbler *A. scirpaceus* and Cetti's warbler *Cettia cettia*.

The citation offers specific management objectives that must not be compromised by proposed developments. As initially set out below it is anticipated that the proposed Allington Lane solar development will not compromise the aforementioned objectives.

Breakdown of potential impacts

At this stage of the application process the potential impacts/effects of the proposed development on the SSSI are understood as:

Table 1: Potential Impacts on SSSI (features and vulnerability)

Site Name	Location	Area (ha)	Reasons for Notification	Management Objectives	Vulnerability of Site
River Itchen SSSI	860m North West	309.26	• classic chalk stream and river, fen meadow, flood pasture and swamp habitats, particularly formations of in-channel vegetation dominated by water crowfoot <i>Ranunculus</i> spp, riparian vegetation communities (including wet woodlands) and side channels, runnels and ditches associated with the main river and former water meadows. Qualifying species: Aquatic • Atlantic salmon <i>Salmo salar</i> • Brook lamprey <i>Lampetra planeri</i> • Bullhead <i>Cottus gobio</i> • Otter <i>Lutra lutra</i> • Water Vole <i>Arvicola Terrestris</i> • Southern damselfly <i>Coenagrion mercuriale</i>	• Rivers & streams • Floodplain Fen • Neutral hay meadow and neutral pasture • Lowland wet woodland • All habitats	• Water pollution; • Invasive species; • Natural changes to site conditions; • Public access / disturbance; • Direct land take from development, and; • Air pollution: impact of atmospheric nitrogen deposition

			• White-clawed (or Atlantic stream) crayfish <i>Austropotamobius pallipes</i> Birds • Tufted Duck <i>Aythya fuligula</i> • Pochard <i>A. ferina</i> • Shoveler <i>Anas clypeata</i> • Waders lapwing <i>Vanellus</i> • Red shank <i>Trainga tetanus</i> • Snipe <i>Gallinago</i> • Sedge warbler <i>Acrocephalus</i> • Snipe <i>Gallinago</i> • Sedge warbler <i>Acrocephalus schoenobaenus</i> • Reed warbler <i>A. scirpaceus</i> • Cetti's warbler <i>Cettia cettia</i>		
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Assessment of Likely Effects to River Itchen

The PADS and CEMP will stipulate comprehensive measures for limiting impact to both local and wider environments, such as the Itchen Valley SSSI. Table 2 below specifically highlights embedded mitigation which will limit the likely effects to the River Itchen.

Table 2: Assessment of impacts on notification features – River Itchen SSSI

River Itchen SSSI:		
Notification Feature	Potential Impact	Site Assessment
Habitats Classic chalk stream and river, fen meadow, flood pasture and swamp habitats, particularly formations of in-channel vegetation dominated by water crowfoot <i>Ranunculus</i> spp, riparian vegetation communities (including wet woodlands) and side channels, runnels and ditches associated with the main river and former water meadows.	• Direct land take • Habitat / community simplification • Physical damage	Construction, Operation, Decommissioning: The project is completely outside of SSSI habitats – therefore there any no perceived effects on any level
		<u>No effects</u>
	• Changes in surface water flooding / hydrology	Construction, Operation, Decommissioning: Minor connectivity via existing field drainage. However, the proposal will not alter/affect the existing drainage system. The uptake of sealed surface will be minor, and the proposed access track will be permeable and as such should not alter the current hydrology of the site.
		<u>No effects</u>

	Air pollution	Construction and Decommissioning: Construction activities do not include significant levels of dust or NOx generating activities. Construction and decommissioning traffic for the development are not considered to be significant. Dust suppression techniques shall be implemented by means of a Construction Traffic Management Plan. Operation: Traffic for the operational solar farm, will be insignificant– therefore the effects of operational traffic are negligible over the lifespan of the development.
	- Water pollution - Changes in water chemistry - Invasive Species	Construction: Construction impacts are isolated to a small footprint and dust generating impacts are related to the construction of new access tracks, installation of solar pilings and cable laying. There are no direct hydrological links to the site and SAC. Existing field drains are the only watercourses within/surrounding the site, these do not have any significant westward flow towards the River Itchen. Also, the closest drains are 450m from the River Itchen at their closest point, project mitigation (silt traps) will be implemented to mitigate any residual risk and ensure that there is no increase in run-off or during construction.

		<u>No likely significant effects</u>
		Operation: No perceived effects
		<u>No effect</u>
		Decommissioning: As per construction.
		<u>No likely significant effects</u>
	Urban edge effects	Operational: Although the proposal is situated in proximity to urban settlements, there are no likely increases in public access (both formally & informally) due to the proposal, this is due to the integral nature of the project. There are no direct or indirect effects that would cause people to utilise designated areas more due to the proposal.
		<u>No effect</u>
Species Atlantic salmon <i>Salmo salar</i>	- Water pollution - Changed chemistry water	Construction, Operation and Decommissioning: No direct hydrological linkage to the River Itchen.

• Brook lamprey <i>Lampetra planeri</i> • Bullhead <i>Cottus gobio</i>	• Species disturbance	Construction, Operation and Decommissioning: The physical distance between the proposal and the River Itchen will provided project integral mitigation against any noise and any physical disturbance that could affect these species. Once operational, disturbance through noise will be negligible.
		<u>No effect</u>
Otter <i>Lutra lutra</i>	• Disturbance	Construction, Operation and Decommissioning: Habitats of principle importance for otter will be restricted to the River Itchen and directly adjacent habitats. Barriers to dispersal between the proposal site and the SAC will likely preclude use and the physical distance between the site and River Itchen will ensure there are no direct impacts to the species.
	• Habitat loss • Physical damage	The proposal will have no impacts on the habitats used by otters. The physical distance between the proposal and the utilised habitat categories will ensure there are no impacts to the species.
	• Water pollution • Turbidity	Habitats of principle importance for otter (River Itchen) are sufficiently separated from the proposal, there are no direct hydrological connections between the proposal and the SAC.
		<u>No effect</u>
Southern damselfly <i>Coenagrion mercurial</i>	• Water pollution • Changed chemistry	Construction, Operation and Decommissioning: Habitats of principle importance for Southern damselfly (River Itchen) are separated from the proposal by natural and anthropogenic barriers, and there are no direct hydrological connections between the proposal and the SAC.

	Habitat loss	Agricultural drains on-site will not provide suitable conditions (permanent flow) for supporting southern damselfly populations. <u>No effect</u>
White-clawed (or Atlantic stream) crayfish <i>Austropotamobius pallipes</i>	- Water pollution - Changed water chemistry	Construction, Operation and Decommissioning: There are no direct hydrological connections to the River Itchen which supports populations of white-clawed crayfish, and agricultural field drains on and surrounding the site will not offer suitable conditions for habitation. Subsequently, there shall be no impact to the species <u>No effect</u>
Birds Tufted Duck <i>Aythya fuligula</i> - Pochard <i>A. ferina</i> - Shoveler <i>Anas clypeata</i> - Waders lapwing <i>Vanellus</i> - Red shank <i>Tringa tetanus</i> - Snipe <i>Gallinago</i> - Sedge warbler <i>Acrocephalus</i> - Snipe <i>Gallinago</i> - Sedge warbler <i>Acrocephalus schoenobaenus</i> - Reed warbler <i>A. scirpaceus</i>	Disturbance	<u>Construction, Operation and Decommissioning:</u> Habitats of principle importance for birds will be restricted to the River Itchen and directly adjacent habitats. Barriers to dispersal between the proposal site and the SSSI will likely preclude use and the physical distance between the site and River Itchen will ensure there are no direct impacts to any of the species.

• Cetti's warbler <i>Cettia cettia</i>		
	• Habitat loss • Physical damage	Construction, Operation and Decommissioning: There are no direct hydrological connections to the River Itchen which supports populations of birds notified, and agricultural field drains on and surrounding the site will not offer suitable conditions for habitation. Subsequently, there shall be no impact to any of the species
		<u>No effect</u>

The proposal site is unlikely to support any of the qualifying species noted within the SSSI citation. Habitats of principal importance for Annex II species are generally directly associated within the River Itchen and its riparian habitat. Habitats on-site are largely sub-optimal/unsuitable for supporting these species, specifically species which are directly associated with watercourses (fish & southern damselfly).

There is minor hydrological connectivity between the site and the SSSI, through existing field drain systems only, however, seasonal flow variations, vegetation and annual drying out of the drains will preclude use by freshwater fish and southern damselfly. Furthermore, the physical distance between the site and the SSSI, and presence of both natural and anthropogenic barriers, will inhibit dispersal of qualifying species (otter) from the SSSI into the site. Consequently, due to a lack of suitable habitat, minor connectivity and embedded mitigation there is unlikely to be any significant impacts on citation species throughout either the construction or operational phase of the proposal.

Further mitigation shall be described in detail within the CEMP, key measures to be included are highlighted in Table 3:

Table 3: Key Mitigation within CEMP

Potential Source of Impact	Mitigation Measures
Construction Works (i.e. Excavation)	Excavation works associated with the construction phase of the development will be monitored by suitably qualified and experienced engineering personnel
	The programming of the works will be such that earthworks/excavations are not scheduled to be carried out during severe weather conditions. Where such weather is forecast, suitable measures will be taken to secure the works and will be outlined within the CEMP
	Underground cables will be laid in trenches that are parallel to access tracks as far as possible. Trenches will be dug during dry weather periods and the cables will be laid quickly and backfilled to minimise water entering the trenches. Suitable drainage measures will be detailed within the construction method statement and will accord with best practice
	Where possible, construction will take place from existing tracks. In addition the building of new site access will be undertaken ahead of the main construction works, minimising the movement of machinery operating over bare soils
	Silt Traps shall be strategically placed where the existing drainage flows towards sensitive areas, in particular along the western boundary.
Runoff	Where the natural drainage pattern flows towards the direction of the SSSI and could be hydrologically connected, drainage measures shall be introduced so as to intercept runoff and ensure there is no increase in runoff towards the SSSI.
Contamination	During construction any oil, fuel or other chemicals will be stored in a suitable temporary storage area. Oil spill clean-up materials will also be stored on site throughout the construction period. If technically viable the use of biodegradable oils will be favoured to further reduce the potential for impact in the event of a spillage
	It is anticipated that concrete will be delivered ready made to the site. Provisions will be made to ensure that deliveries are supervised by qualified personnel and site staff should be aware of what to do in the event of spillage. Mitigation measures will be outlined within the CEMP with regards to concrete delivery and will be carried out in accordance with Environment Agency guidance

	Washing out of the delivery vehicles will be carried out to ensure that washings do not pollute surface water at the site, and it is proposed to undertake the washing out of concrete trucks offsite at the source location
	Any stored diesel or fuel oils will be bunded to 110% of capacity. The turbine transformer enclosure will be self-contained or bunded to preclude the release of contaminants to the environment

The Agent considers that with implementation of aforementioned mitigation measures to complement existing embedded mitigation, there would be a **Negligible** likelihood of impact from the proposed development to the interest features of the SSSI.

Conclusion

The proposed development has been carefully designed and managed with the River Itchen SSSI considered from an early stage. Table 2 illustrates the embedded mitigation that the Site has which will limit the potential impacts from the development onto the interest features of the SSSI. Furthermore, the measures within the environmental assessments shall go further to avoid and mitigate potential impacts on the local environment, of which the River Itchen SSSI is a significant feature.

Construction works shall be undertaken with best practice guidelines and the CEMP shall stipulate the measures to be taken to ensure a comprehensive protection of the environment, including specific measures that account for the protection of the interest features of the SSSI in line with this report.

The proposed development seeks to mitigate potential impacts which shall be discussed at length within the PDAS and summarised within this report. The application site seeks to produce renewable energy which will deliver positive enhancements over a prolonged period of time, including measures to boost the biodiversity on site. Climate change does present a risk to the notification interests of the SSSI and so the site looks to reduce impacts and deliver positive effects to the River Itchen by means of considered embedded mitigation and contribution to decarbonising the UK electricity network.

The Applicant is open to further consultation should Natural England consider it necessary.