



Keuper Gas Storage Project

Mitigation Schedule
rev. 1

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KEUPER GAS STORAGE PROJECT

MITIGATION SCHEDULE

REV.1

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MITIGATION TABLES

1. Below is a summary of mitigation measures as set out in the Environmental Statement (Document Reference 6.1) for the Project. The tables are provided as clarification only and do not represent new information.
2. Table 1 presents mitigation measures that will apply during construction and Table 2 provides a summary of mitigation measures for the operational phase at the Main Assessment Area.
3. Table 3 presents mitigation measures that will apply during construction and Table 4 provides a summary of mitigation measures for the operational phase at Whitley Pumping Station.
4. Table 5 presents mitigation measures that will apply during construction and Table 6 provides a summary of mitigation measures for the operational phase at Runcorn Outfall

Table 1 – Mitigation During Construction – Main Assessment Area			
Environmental Topic	Effect and Mitigation Measure	When / Where Required	Delivery Mechanism within the DCO Application
Geology, Land and Water Quality	Effect on human health <ul style="list-style-type: none"> Contaminated land will be identified and avoided during excavation. Construction workforce will wear Personal Protective Equipment (PPE). Potentially hazardous waste soils will be handled and stored in accordance with Technical Guidance WM3. 	During construction of roads, pipelines and compounds etc. which involve soil excavation	Schedule 2 requirement 3 (CEMP) site waste management plan Schedule 2 requirement 14 (land contamination)
	Potential for contaminants to relocate or mobilise <ul style="list-style-type: none"> Contaminated land will be identified and avoided during excavation. Potentially hazardous waste soils will be handled and stored in accordance with Technical Guidance WM3. Construction bunds, temporary site drainage and sediment traps will be installed as required. 	During construction of roads, pipelines and compounds etc. which involve soil excavation	Schedule 2 requirement 3 (CEMP) surface and groundwater management plan, site waste management plan Schedule 2 requirement 12 (ground & surface water and pollution prevention) and 14 (land contamination)
	Potential for mud-brine drilling fluids or similar to contaminate underlying aquifer during drilling <ul style="list-style-type: none"> Telescopic steel casing will be inserted and cemented in place through the soil and bedrock to prevent groundwater from entering the drilled borehole and prevent loss of containment of drilling fluids and contamination of surrounding horizons. Boreholes will be appropriately constructed to eliminate the risk of gas leakage. Site-specific geological and rock-mechanical information will be used to design each borehole casing, suitably resilient materials will be used and casing strings will be cemented in. All fuels, muds and other chemical storage and handling areas will be in accordance with EA PPG2. 	During borehole drilling at wellsites	Schedule 2 requirement 3 (CEMP) surface and groundwater management plan Schedule 2 requirement 12 (ground & surface water and pollution prevention)
	Potential for accidental leaks or spills <ul style="list-style-type: none"> Fluids will be stored, handled, mixed and collected in tanks in properly surfaced and bunded areas. Construction bunds, temporary site drainage and sediment traps will be installed as required. There will be rapid spill response planning. Measures in the CEMP will be implemented. 	During all construction activities including (but not limited to) excavations, road building, pipe laying and borehole drilling	Schedule 2 requirement 3 (CEMP) surface and groundwater management plan Schedule 2 requirement 12 (ground & surface water and pollution prevention)
	Damage to soils from earthworks <ul style="list-style-type: none"> Where soils are not back-filled, topsoil's will be stockpiled to a specific methodology to 	During construction of roads, pipelines and compounds etc. which involve soil	Schedule 2 requirement 3 (CEMP) soil management plan

	be described in a Soil Management Plan (SMP), compliant with DEFRA Guidance	excavation	
	<p>General effects during foundation works and general earthworks</p> <ul style="list-style-type: none"> The contractor will be required to adhere to the CEMP which will be enforced by the local authority. A separate Sediment Control Plan (SCP) will be designed and followed by contractors throughout the construction process. 	During construction of roads, pipelines and compounds etc. which involve soil excavation	Schedule 2 requirement 3 (CEMP) generally, and specifically the sediment control plan
Ecology	<p>GCN</p> <p>The GCN work will be subject to a European Protected Species licence and the working methods and mitigation required to ensure maintenance of favourable conservation status will be agreed with NE. Captured amphibians will be released outside of the working area in suitable habitat. Mitigation for impacts to terrestrial habitat used by GCN will also be undertaken. Mitigation will include:</p> <ul style="list-style-type: none"> reinstatement of terrestrial habitats post-development with habitats of equivalent or greater value than those lost; nine hibernacula and nine refuges for GCN will be provided in key locations across the site; and restoration of 36 existing ponds to improve their suitability as breeding sites for GCN, including measures such as de-silting, removal or cutting back of shading trees on pond banks, removal of willow encroachment or excessive vegetation growth such as bulrush and horsetail, and introduction of suitable aquatic plants. 	<p>Prior to, during and following any construction activity</p> <p>Any necessary capture will be carried out during the autumn/winter months to avoid the GCN breeding season and minimise impacts on GCN larvae.</p>	<p>Schedule 2 requirement 3 (CEMP) biodiversity management plan</p> <p>Schedule 2 requirement 21 (European protected species)</p>
	<p>BATS</p> <ul style="list-style-type: none"> Impacts to any confirmed bat roosts will be avoided as far as possible by micro-siting and the timing of construction works. If reasonable avoidance measures cannot be employed, a licence for disturbance to a roost may be required. It is likely that the bat boxes could be moved to a nearby tree out of the range of disturbance impacts. Hedgerow gaps that may disrupt bat movements will be reduced by re-instatement of any temporary removal. Hedgerow creation, woodland planting and pond restoration associated with GCN mitigation will also benefit bats. Enhancement through the establishment of flower meadows around the gas processing plant and the solution mining compound, adjacent to the woodland at Drakelow Gorse, will also benefit bats by improving insect numbers and diversity. Clearance of the single tree to be removed will use soft fell techniques or a precautionary inspection immediately prior to felling to check for the presence of any bat roosts. 	<p>Prior to, during and following any construction activity</p>	<p>Schedule 2 requirement 3 (CEMP) biodiversity management plan</p> <p>Schedule 2 requirement 21 (European protected species)</p>

	<p>BADGERS</p> <ul style="list-style-type: none"> • Trenches which cross established mammal pathways (such as badger or otter) will be left open overnight, a series of parallel planks will be provided at the main crossing points to maintain the access across the trench. Planks will also be placed in the trench at an angle of 45 degrees to allow animals an escape route in the event that they fall into the trench. • Any temporarily exposed open pipe system will be capped in such a way as to prevent animals gaining access. 	Prior to, during and following any construction activity	Schedule 2 requirement 3 (CEMP) biodiversity management plan
	<p>BREEDING BIRDS</p> <p>Removal of hedgerows and other potential nesting habitat will be conducted outside the bird breeding season</p> <ul style="list-style-type: none"> • There will be some offset of habitat loss through planting around wellheads. 	Outside of the period from March to the end of July to avoid disturbance to actively breeding birds.	Schedule 2 requirement 3 (CEMP) biodiversity management plan Schedule 2 requirement 21 (European protected species)
Noise and Vibration	<p>Noise from construction plant during the various phases of site preparation and installation of equipment and structures</p> <ul style="list-style-type: none"> • The use of low noise equipment, mobile screens and careful scheduling of works is likely to be able to reduce noise levels during construction. Generally this type of mitigation can be expected to reduce noise levels by up to approximately 10 dB(A). 	During all construction activities including (but not limited to) excavations, road building, pipe laying and borehole drilling	Schedule 2 requirement 3 (CEMP) – noise and vibration management and monitoring plan
	<p>Noise from drilling during cavern creation, including from solution mining equipment</p> <ul style="list-style-type: none"> • Mitigation during night-time drilling (likely to be along the lines of modification to the plant or additional local noise screening or noise insulation at the receptor point). This will be identified further through the detailed design process. 	During borehole drilling at wellsites	Schedule 2 requirement 3 (CEMP) – noise and vibration management and monitoring plan
	<p>Construction traffic</p> <ul style="list-style-type: none"> • Light vehicles will park just off the main road in the construction car park, which is over 100 m from the nearest NSR and it is expected that vehicles will not cause disturbance at this distance. • A site speed limit will be enforced. • A one-way traffic system around the site will minimise noise from reversing alarms. 	During all construction activities including (but not limited to) excavations, road building, pipe laying and borehole drilling	Schedule 2 requirement 3 (CEMP) – noise and vibration management and monitoring plan
Air Quality	<p>Emissions to air from construction activities</p> <ul style="list-style-type: none"> • Machinery and dust causing activities will be located away from sensitive receptors where possible. • A site manager will be on site during working times to maintain a logbook and carry out site inspections; • Haul routes will be hard surfaced as soon as possible to reduce dust. • Dust generating activities, such as open stockpiling, will be minimised. 	During all construction activities including (but not limited to) excavations, road building, pipe laying and borehole drilling	Schedule 2 requirement 3 (CEMP) traffic management plan Schedule 2 requirement 8 (construction traffic)

	<ul style="list-style-type: none"> • Stockpiles will be covered, seeded or fenced to prevent wind whipping. • Exposed areas of earthworks will be re-vegetated. • Appropriate permits will be obtained for any concrete crushers or batchers required on-site. • On-road vehicles will comply to set emission standards (EURO IV). • All non-road mobile machinery (NRMM) will use ultra-low sulphur tax exempt diesel (ULSD) where available and be fitted with appropriate exhaust after-treatment. 		s.106 (HGV routing requirement)
Cultural Heritage	<p>Disturbance and potential loss of unknown heritage assets</p> <p>All groundworks will be supervised by a suitably qualified archaeologist and in accordance with a Written Scheme of Investigation to be agreed with Cheshire West and Chester Council.</p>	During all construction activities including (but not limited to) excavations, road building, pipe laying	<p>Schedule 2 requirement 3 (CEMP) archaeological management plan</p> <p>Schedule 2 requirement 15 (archaeology)</p>
Traffic and Transport	<p>Potential to alter traffic patterns</p> <p>A HGV Routing Plan will be secured through a Section 106 agreement, in consultation with the local highway authority, and will identify appropriate routes for use by HGVs.</p>	Prior to any construction activity taking place. Monitoring thereafter	<p>Schedule 2 requirement 3 (CEMP) traffic management plan</p> <p>Schedule 2 requirement 7 (access to Works)</p> <p>s.106 (HGV routing requirement)</p>
Socio-economic Characteristics	<ul style="list-style-type: none"> • Appropriate emergency access routes and site security, including fencing around the permanent plant and wellhead compounds will be installed on site. • The requirements of the Construction (Design and Management) Regulations 2015 as amended and subsequent amendments will be adhered to. • A CEMP will be produced for the Project, including traffic management, noise and air quality procedures. This will reduce disruption to the local community. It will also detail the communications plan and complaints mechanism. • Public rights of way will be diverted during the construction phase to maintain access. 	During all construction activities including (but not limited to) excavations, road building, pipe laying and borehole drilling	<p>Schedule 2 requirement 11 (fencing and other means of enclosure)</p> <p>Schedule 2 requirement 3 (CEMP)</p>
Landscape and Visual	<p>Effects on landscape and visual receptors</p> <ul style="list-style-type: none"> • Land clearance and occupation will be limited to the minimum necessary for the works. • Construction site lighting will be restricted outside normal working hours as far as practicable to the minimum required for safety and security. • Directional lighting will be used to limit unwanted light spill, which will be positioned and angled away from any sensitive visual receptors. • The site compound will be kept tidy and well maintained. • Topsoil will be spread and turf replaced, or reseeded and planted as soon as possible after sections of work are complete. Earthwork bunding and/or hedgerow will be established early within the construction programme to help to further reduce impacts during construction and drilling. 	During all construction activities including (but not limited to) excavations, road building, pipe laying and borehole drilling	<p>Schedule 2 requirement 3 (CEMP) soil management plan, landscaping and visual impacts plan</p> <p>Schedule 2 requirement 6 (landscaping)</p> <p>Schedule 2 requirement 13 (hedgerows)</p> <p>Schedule 2 requirement 16 (external lighting)</p>

Table 2 – Mitigation During Operation – Main Assessment Area			
Environmental Topic	Effect and Mitigation Measure	When / Where Required	Delivery Mechanism within the DCO Application
Geology, Land and Water Quality	<ul style="list-style-type: none"> • Process chemicals will be stored and handled in properly surfaced and bunded areas in accordance with EA PPG2. • All oil-water separators will be regularly checked and cleaned out to ensure correct operation. • There will be rapid spill response planning and training for workers in appropriate procedures for spills. 	During all operational phases	<p>Schedule 2 requirement 3 (CEMP) generally, and surface and groundwater management plan in particular</p> <p>Schedule 2 requirement 12 (ground and surface water and pollution prevention)</p>
Noise and Vibration	<ul style="list-style-type: none"> • The gas processing plant will be designed to be non-tonal. Where this is not possible, equipment will be selected to ensure that appropriate noise levels are achieved. • In terms of external plant, lower noise fans have been selected. As part of the detailed design, the specification of fans can be refined to take advantage of technical advances. 	During all operational phases	Schedule 2 requirement 5 (control of noise during normal operation)
Air Quality	Table 26.1 of the Environmental Statement wrongly suggests, at page 26-8, that the gas processing plant will operate under an environmental permit issued by the Environment Agency. In fact, the Environment Agency has advised that an environmental permit will not be required – see paragraph 4.11 of the Statement of Common Ground between the Applicant and the Environment Agency dated December 2015 (Doc ref. 10.3). The Environmental Statement concludes that no mitigation in respect of air quality is necessary for the operational phase as impacts are negligible – see section 10.6 of the Environmental Statement at pages 10-33 to 10-34.	N/A	N/A
Traffic and Transport	<ul style="list-style-type: none"> • Access to the Main Assessment Area will be through dedicated access roads for the Project. 	During all operational phases	Schedule 2 requirement 7 (access to Works)
Landscape and Visual	<ul style="list-style-type: none"> • No additional mitigation to those in construction phase mitigation. 	During all operational phases	As per Table 1.

Table 3 – Mitigation During Construction – Whitley Pumping Station			
Environmental Topic	Effect and Mitigation Measure	When / Where Required	Delivery Mechanism within the DCO Application
Noise and Vibration	<ul style="list-style-type: none"> Working hours will be restricted to daytime hours. Mitigation inherent in the design includes locating some equipment within enclosures and buildings, and the selection of appropriately low noise fans. 	During all construction activities	Schedule 2 requirement 3 (CEMP) noise and vibration management plan
Traffic and Transport	<ul style="list-style-type: none"> A Traffic Management Plan will be prepared as part of the CEMP, in consultation with the local highway authority, to secure elements such as appropriate routes for use by HGVs 	Prior to any construction activity taking place. Monitoring thereafter	Schedule 2 requirement 3 (CEMP) traffic management plan

Table 4 – Mitigation During Operation – Whitley Pumping Station			
Environmental Topic	Effect and Mitigation Measure	When / Where Required	Delivery Mechanism within the DCO Application
Noise and Vibration	<ul style="list-style-type: none"> The above noted mitigation inherent in the design is sufficient to mitigate noise impacts during operation. 	Agreement with local authority prior to commencement of operation	Schedule 2 requirement 5 (control of noise during normal operation)
Traffic and Transport	<ul style="list-style-type: none"> No specific mitigation 		

Table 5 – Mitigation During Construction – Runcorn Outfall			
Environmental Topic	Effect and Mitigation Measure	When / Where Required	Delivery Mechanism within the DCO Application
Cultural Heritage	<ul style="list-style-type: none"> • A targeted archaeological watching brief of the ground works will be implemented. Any surviving remains of the Limekilns in Runcorn will be recorded. • Prior to any works taking place on Telford’s Wall, ground investigations undertaken as part of the detailed engineering design will also be subject to an archaeological watching brief. 	<p>During all of the civil construction period</p> <p>General construction to be between April and September</p>	<p>Schedule 2 requirement 3 (CEMP) archaeological management plan</p> <p>Schedule 2 requirement 15 (archaeology)</p>
	Geology and Ground Contamination	<p>Effects on construction workforce</p> <ul style="list-style-type: none"> • Contaminated land will be identified and avoided during excavation. • Workers will wear PPE. • Potentially hazardous waste soils will be handled and stored in accordance with Technical Guidance WM3. • Dust will be suppressed using industry standard techniques. 	<p>During all construction activities including excavations, foundation formation and pipe laying</p>
<p>Effects on surface waters (Weston Canal and MSC)</p> <ul style="list-style-type: none"> • Contaminated land will be identified and avoided during excavation • Potentially hazardous waste soils will be handled and stored in accordance with Technical Guidance WM3 • Construction bunds, temporary site drainage and sediment traps will be installed as required. 		<p>During all construction activities including excavations, foundation formation and pipe laying</p>	<p>Schedule 2 requirement 3 (CEMP) generally, and surface and groundwater management plan in particular</p> <p>Schedule 2 requirement 12 (ground & surface water and pollution prevention)</p>
<p>Potential for accidental leakage, or spills of fuels and oils</p> <ul style="list-style-type: none"> • Storage, handling and fuelling will be undertaken in properly surfaced and bunded areas • Construction bunds, temporary site drainage and sediment traps will be installed as required • Measures set out in the CEMP will be implemented. 		<p>During all construction activities including excavations, foundation formation, pipe laying and installation of pipebridge</p>	<p>Schedule 2 requirement 3 (CEMP) generally, and surface and groundwater management plan in particular</p> <p>Schedule 2 requirement 12 (ground & surface water and pollution prevention)</p>
<p>General effects during foundation works and general earthworks</p> <ul style="list-style-type: none"> • The same measures as outlined for the Main Assessment Area will be applied at Runcorn Outfall, including compliance with the CDM Regulations 2015, Environment Agency Pollution Prevention Guidelines and the CEMP. 		<p>During all civil construction activities including excavations and foundation formation</p>	<p>Schedule 2 requirement 3 (CEMP)</p> <p>Schedule 2 requirement 12 (ground & surface water and pollution prevention)</p>
Landscape and Visual		<ul style="list-style-type: none"> • Land clearance and occupation will be limited to the minimum necessary for the works • Directional lighting will be used to limit unwanted light spill, which will be positioned and angled away from any sensitive visual receptors • The site compound will be kept tidy and well maintained • Topsoil will be spread and turf replaced, or reseeded and planted as soon as possible after sections of work are complete. 	<p>During the period from September to March</p>
	<p>During all construction activities including excavations foundation formation</p>		<p>Schedule 2 requirement 16 (external lighting)</p>

Table 6 – Mitigation During Operation – Runcorn Outfall			
Environmental Topic	Effect and Mitigation Measure	When / Where Required	Delivery Mechanism within the DCO Application
Geology and Ground Contamination	<p>Potential for accidental leakage</p> <ul style="list-style-type: none"> • The brine pipeline will be properly maintained and subject to testing to reduce the potential for accidental leakages. • Process chemicals to be stored and handled in properly surfaced and bunded areas in accordance with EA PPG2 • As set out in the CEMP, there will be rapid spill response planning and training for workers and appropriate EMPs will be developed and implemented 	Throughout the operational period	<p>Schedule 2 requirement 3 (CEMP) generally, and surface and groundwater management plan in particular</p> <p>Schedule 2 requirement 12 (ground & surface water and pollution prevention)</p>
Marine Environment	<ul style="list-style-type: none"> • The outfall will operate under an existing discharge consent issued by the Environment Agency (Permit Reference EPR/DP3424GK). 	Throughout the operational period	N/A