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The M4 Motorway (Junction 23 (East of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and The M48 Motorway (Junction 23 (East of Magor) Connecting Road) Scheme 201-

The M4 Motorway (Junction 23 (East of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and The M48 Motorway (Junction 23 (East of Magor) Connecting Road) (Amendment) Scheme 201-

The London to Fishguard Trunk Road (East of Magor to Castleton) Order 201-

The M4 Motorway (West of Magor to East of Castleton) and the A48(M) Motorway (West of Castleton to St Mellons)(Variation of Various Schemes) Scheme 201-

The M4 Motorway (Junction 23 (East of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and the M48 Motorway (Junction 23 (East of Magor) Connecting Road) and The London to Fishguard Trunk Road (east of Magor to Castleton) (Side Roads) Order 201-

The Welsh Ministers (The M4 Motorway (Junction 23 (East of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and the M48 Motorway (Junction 23 (East of Magor) Connecting Road) and the London to Fishguard Trunk Road (East of Magor to Castleton)) Compulsory Purchase Order 201-

The M4 Motorway (Junction 23 (East Of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and The M48 Motorway (Junction 23 (East Of Magor) Connecting Road) (Supplementary) Scheme 201-

The Welsh Ministers (The M4 Motorway (Junction 23 (East Of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and The M48 Motorway (Junction 23 (East Of Magor) Connecting Road) and The London to Fishguard Trunk Road (East of Magor to Castleton)) Supplementary Compulsory Purchase Order 201-

Summary Proof of Evidence

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Welsh Government, Land Contamination

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1. Summary Statement of Evidence – Contamination

- 1.1. My name is Andy Clifton and I am employed by RPS Planning and Development, a division of RPS Group plc as an Operational Director.
- 1.2. My academic qualifications include a BSc Honours Degree in Geology and an MSc Degree in Engineering Geology. I am a Chartered Engineer, Chartered Scientist and Chartered Environmentalist.. I also hold 'Advisor' status on the UK Register of Ground Engineering Professionals and I am a CL:AIRE Qualified Person.
- 1.3. I have over twenty years' experience in the construction and development industry, primarily as a land contamination specialist.
- 1.4. I have been the lead for contamination on the M4CaN scheme since the Costain Vinci Joint Venture (CVJV) was awarded the Key Stage 3 and 4 contract by Welsh Government in 2015, having advised the CVJV team during the tendering process.

2. Methodology, Policy and Guidance

- 2.1 In Wales, Part IIA of the Environmental Protection Act (EPA) 1990 (Document 12.1.1), as introduced by Section 57 of the Environment Act 1995, is implemented by the Contaminated Land (Wales) Regulations 2006 as amended¹ (Document 12.1.7). Under Part IIA of the EPA, sites can be determined by the Local Authority as 'contaminated land' if they are causing, or if there is a significant possibility of causing, significant harm to human health or significant pollution of controlled waters. Controlled waters are defined by the Water Act 2003 (Document 12.1.5) as including both surface waters and groundwater within an aquifer. In general terms, the legislation advocates the use of a risk assessment approach to assessing contamination and remedial requirements. The contaminated land regime under EPA Part IIA is focussed on the identification and subsequent management of contaminated sites based

¹ Contaminated Land (Wales) Regulations 2012

on existing use. In the case of a change in use contamination is managed under the planning regime.

- 2.2 Planning Policy Wales (PPW Edition 9, Document 5.1.12) sets out the inter-relationship between the contaminated land regime under the provisions of Part IIA of the EPA and the planning regime. In paragraph 13.7.4 PPW sets out that a development will not lead to the site being designated as contaminated land under Part IIA and the onus is on the developer to ensure this. The local planning authority's role is to ensure that the land is suitable for its proposed use.
- 2.3 The EPA Part IIA contaminated land regime and local and national planning policy all require a risk based approach to managing land contamination. For a risk to exist a viable pathway must exist between any contaminant and a receptor (i.e. there must be a contaminant linkage). The presence of contamination alone does not necessarily require remediation. Only contamination considered to be causing an unacceptable risk should be remediated.
- 2.4 As the Scheme is for a new highway under the Highways Act 1980 (Document 3.1.5) and is subject to the need for an EIA, the assessment was carried out in line with the Design Manual for Roads and Bridges (DMRB) guidance, specifically the methodology described in DMRB 11.3.11 Geology and Soils (Document 6.1.2). In addition the Scheme was designed following DMRB 4.1.2 HD22/08 Managing Geotechnical Risk (Document 12.2.23) which refers to further guidance on addressing potential land contamination (DMRB 4.1.7 HA 73/95. Site Investigation for Highway Works on Contaminated Land (Document 12.2.24)).
- 2.5 The HA 73/95 guidance requires adequate ground investigation to be carried out. Since it was published in 1995, new legislation has come into force (including the Contaminated Land (Wales) Regulations in 2006 (amended in 2012) and further guidance on the assessment and management of land contamination is now available (including the Model Procedures for the Management of Land Contamination (CLR11) (Document 12.2.3). As such, the

approach taken to assess land contamination has adopted more recent guidance which is centred on CLR11. This guidance is advocated by Natural resources Wales (NRW), Monmouthshire County Council (MCC) and Newport County Council (NCC) and is also cited within the Welsh Local Government Association document Development on Land Affected by Contamination: A Guide for Developers (Document 12.2.10). The adopted approach taken to the assessment of land contamination has considered the effects of land contamination on the Scheme during construction and operation. The approach taken was also agreed with NRW, MCC and NCC (December 2016 ES Supplement Appendix SR11.3 (Document 2.4.14)).

- 2.6 The CLR11 guidance sets out a phased approach to land contamination management starting with a preliminary risk assessment, then further investigation and assessment is carried out where potential unacceptable risks may exist. This is followed by a remedial options appraisal, remediation design and then implementation where risks are considered unacceptable. Finally, verification of remediation is undertaken to demonstrate that the remediation was effective.

3. Establishment of Baseline Conditions and Land Contamination Risk Assessment

- 3.1 Five previous ground investigations have been undertaken within the permanent and temporary land take of the Scheme and these are shown on Figures 3a-p of my evidence.
- 3.2 Since the publication of the March 2016 ES an additional ground investigation was completed. This later 2016 Additional Ground Investigation was undertaken to provide further data on ground conditions in areas where limited or no ground investigation data was previously available. It was also undertaken to provide further data on some of the previously identified, known and potentially contaminated sites to verify the risk levels identified in the March 2016 ES and to support the development of the remediation design. The sampling locations of the 2016 Additional Ground Investigation are shown on Figures 3a-p of my evidence.

- 3.3 The 2014 Preliminary Sources Study Report (PSSR) (Document 12.3.3) and more recent 2015 and 2016 ground investigations and assessments have identified the general ground conditions along the Scheme. Twenty-seven potentially contaminated sites along the proposed new section of motorway were identified and are shown on Figure 1a-d of my evidence. Each of the 27 potentially contaminated sites has been subject to an individual assessment of potential risks to human health and controlled waters and a report has been prepared for each site (March 2016 ES Appendix 11.1 and September 2016 ES Supplement Appendix R11.1 (Document 2.4.4).
- 3.4 For the majority of the 27 identified potentially contaminated sites, normal safe working procedures and industry good practise that would be adopted on a typical construction-site on brownfield land would be adequate to mitigate risks. Notwithstanding these general measures, the following 13 potentially contaminated sites would need additional site controls and procedures during construction to mitigate risks to construction workers:
- a) CL-13 Docks Way Landfill
 - b) CL-14 Newport Docks (including CL-16 Infilled River Ebbw)
 - c) CL-15 Stephenson St Industrial Estate (including CL-20 Mir Steel Works and Waste Disposal Site)
 - d) CL-17 Solutia Chemical Works
 - e) CL-18 River Usk Pier Location
 - f) CL22 Former Llanwern Research Laboratories
 - g) CL-26 Llanwern Steelworks including Lagoons
 - h) CL-27 Elver Pill Reen and Green Moor Landfill
 - i) CL-32 Magor Depot
 - j) CL-35 Magor Services
 - k) CL-39 The Elms Road Old Quarry and Lime Kiln
- 3.5 Mitigation is required to prevent potential risks to future motorway maintenance workers at CL-17 from shallow soil contamination. The mitigation would be achieved by placing a layer of clean soils across the affected area.

- 3.6 During construction the greatest potential risk to controlled waters without mitigation is considered to be from uncontrolled contaminated run-off entering sensitive surface waters, including the Gwent Levels SSSI particularly from CL-26 (TATA Steel Llanwern Steelworks site) but also from CL-13, CL-17, CL-22, CL-27 and CL-35. The potential risk during construction of contaminants leaching from soils and perched groundwater, either migrating downwards into underlying aquifers or entering surface waters, requires mitigation at eleven potentially and known contaminated sites (CL-13, CL-17, CL-18, CL-22, CL-26, CL-27, CL-32, CL-33, CL-35, CL-39 and CL-41). During operation of the Scheme the assessments indicate that the risk to controlled waters would be low for 21 of the 27 sites with the 6 remaining sites (CL-17, CL-22, CL-33, CL35, CL39 and CL-41) being considered either moderate or moderate to low risk. Nonetheless for these 6 sites remedial action would be required to mitigate potential risks.
- 3.7 An assessment of risks during construction and operation of the Scheme from potentially hazardous ground gases has been undertaken. The assessment has identified that gas control measures and safe working procedures would be required during construction groundworks within the Tidal Flat Deposits, particularly associated with piling and band drain installation in order to protect construction workers from ground gas. Additional detailed assessments to enable specific safe methods of working would be needed to protect construction workers within CL-26 due to the potential for hydrogen sulphide and carbon monoxide to be encountered during excavations within the lagoons. Additional controls and safe working construction methods would be needed in other potentially contaminated sites including CL-13, CL-14 CL-35 and CL-39 due to the potential presence of landfill gases being generated from historical tipping activities. In CL-15, CL-17, CL-26 and CL-32 potential hydrocarbon contamination may necessitate additional safety controls to protect construction workers from exposure to volatile organic compounds.
- 3.8 The gas risk assessment has also identified the need for gas controls to be incorporated into the design of the new section of motorway in order to mitigate

a potential increase in risk of ground gases migrating off-site and impacting adjacent properties.

4. Summary of Risks from Land Contamination

- 4.1 Although potentially polluting historical activities may have taken place, the investigations and risk assessments have identified risks to human health and the environment are low to very low at 12 of the potentially contaminated sites (CL-1, CL-2, CL-3, CL-4, CL-5, CL-6, CL-8, CL-9, CL-10, CL-29, CL-30 and CL-38). For the other 15 known contaminated sites, namely CL-13, CL-14, CL-15, CL-16, CL-17, CL-18, CL-20, CL-22, CL-26, CL-27, CL-32, CL-33, CL-35, CL-39 and CL-41, remediation and or controls would be required in order to mitigate risks from contamination.
- 4.2 In addition, and as with any construction project where brownfield land is present, there is a chance that previously unidentified and unknown contamination, including asbestos contaminated materials and ground gas, may be encountered unexpectedly. To mitigate this risk contingency plans and controls would have to be put in place during construction. Similarly, the handling and management of potentially contaminated soils generated from excavations such as cuttings or foundations would also require careful management. These issues are addressed within the Outline Remediation Strategy Report (Appendix R11.2 of the September 2016 ES Supplement (Document 2.4.4)) and the project team is committed to the production and implementation of the final Remediation Strategy Report. The production of the Remediation Strategy Report is listed as item 71 within the Register of Commitments Update within Appendix SR18.1 of the December 2016 ES Supplement.

5. Land Contamination Remediation and Mitigation

- 5.1 An outline Remediation Strategy Report has been prepared. The need to mitigate risks from land contamination has been considered throughout the design of the Scheme. Understanding the need for remediation of unacceptable risks and the management of known and potentially contaminated soils and waters increased following ground investigations in 2015 and 2016.
- 5.2 The primary purpose of the remediation strategy is to mitigate potential risks to human health and the environment from land contamination based upon the published Scheme. The Outline Remediation Strategy Report that has been produced would continue to be developed prior to construction commencing and considers mitigation of land contamination risks during both construction and operation of the Scheme.
- 5.3 A sustainable approach to the management of land contamination during the construction of the Scheme has been adopted wherein unnecessary remediation and off-site disposal of contaminated soils is to be avoided. During the design of the Scheme, the approach to the remediation strategy has been discussed with MCC, NCC and NRW. NCC have commented that the remedial strategy will beneficially address historical land contamination along the route of the proposed section of motorway. NRW have commented that the treatment of the lagoon materials to enable their reuse is a sustainable approach. The remediation strategy would be developed further during the detailed design of the Scheme. It would then be submitted to NRW, MCC and NCC prior to construction commencing to seek their approval.
- 5.4 In order to construct the motorway embankment a considerable volume of general fill is required. In order to help mitigate the need to import primary or secondary aggregates from off-site sources, and the associated traffic impacts, the reuse of soils and rock on-site has been a key consideration during Scheme development. The motorway embankment has been designed such that contaminated soils excavated during construction (for instance in areas of cutting through a potentially contaminated site) may be reused as general fill within the embankment subject to compliance with suitability for reuse criteria.

The reuse of contaminated soils within the Scheme would also reduce the environmental impact of removing contaminated soils for off-site disposal to landfill and traffic impacts of waste disposal lorry movements. The suitability for reuse criteria would ensure that the reused contaminated soils are both geotechnical suitable and do not cause an unacceptable risk to the environment or human health once placed within the embankment. 591,000 m³ of lagoon silts and slag at the TATA Steel Llanwern Steelworks site (CL-26) will require treatment prior to reuse (as described in Mr Barry Woodman's Proof of Evidence WG 1.6.1).

- 5.5 The Outline Remediation Strategy Report also sets out an outline remediation implementation plan that includes procedures for excavation of materials, handling arrangements, dealing with unexpected contamination and monitoring. Figures 3a-d of my evidence shows a summary of the remediation strategy. An outline remediation verification plan is also set out which describes requirements to ensure that adequate records and information would be gathered during construction to provide 'lines of evidence' to demonstrate the remediation was successful. The Outline Remediation Strategy Report also sets out the need for ground gas, surface water and groundwater assurance monitoring during and after construction
- 5.6 An Outline Materials Management Plan (March 2016 ES, Appendix 3.2, Annex H (Document 2.3.2) has also been prepared in accordance with the CL:AIRE Definition of Waste Code of Practice (Document 12.2.8) which would be updated and submitted to NRW prior to construction in order to demonstrate in further detail how contaminated materials would be managed and tracked during the works so as not to cause an unacceptable risk to the environment or human health.

6. Solutia Chemical Works

6.1 The design of the Scheme has avoided the need to disturb the Polychlorinated biphenyl (PCB) waste disposal 'cell' at Solutia Chemical Works. This has been achieved by the new section of motorway bridging over the PCB cell.

7. Docks Way Landfill

7.1 The design of the Scheme has avoided the need to disturb engineered parts of Docks Way Landfill. It has also been designed to minimise the amount of excavation within areas where waste may have been historically tipped in order to reduce potential arisings unsuitable for reuse being generated.

8. TATA Steel Llanwern Steelworks

8.1 The affected areas of the lagoons at Llanwern would require:

- a) Excavation and reinstatement of the lagoons and existing drainage systems to the north of the new proposed section of motorway. This is shown on Figure 2 of my evidence
- b) Coarse slag will be reused to reform the lagoon bunds
- c) Surplus coarse slag and lagoon silt would be reused within the motorway embankment subject to meeting suitability for reuse criteria

8.2 Treatment of lagoon materials is expected to be needed prior to reuse within the embankment of the new section of motorway. An appropriately experienced specialist remediation subcontractor would undertake the treatment of materials on TATA Steel land to the north of the new section of motorway. The treatment of materials from lagoons will fall under the Environmental Permitting (England & Wales) Regulations 2010 (as amended) (Document 12.1.9) and an environmental permit will be obtained from NRW.

8.3 The process and documentation of treatment of materials would need to demonstrate to NRW that those materials are fully recovered so that they can be designated as no longer needing regulation as waste. This process would

be set out in the final Remediation Strategy Report and agreement sought from NRW.

- 8.4 The proposed new section of motorway will impact on six existing environmental permits held by various industrial site operators. An Environmental Permitting Strategy Report (March 2016 ES, Appendix 11.5) has been prepared and also discussed with NRW. It sets out the general approach to be adopted and supporting information that would be required to surrender and vary the existing permits to accommodate the Scheme.

9. Remediation Verification and Monitoring

- 9.1 Following completion of all remediation and earthworks, a remediation verification report would be prepared in order to provide evidence that the remediation had been implemented successfully and would be provided to MCC, NCC and NRW to seek approval. Following construction, five years of surface water, groundwater and ground gas assurance monitoring would be undertaken and this is listed as Ref. No. 145 in the Register of Environmental Commitments (Appendix SR18.1 of the December 2016 ES Supplement (Document 2.4.4)).

10. Conclusion

- 10.1 The Scheme would result in beneficial environmental improvement as the risks to human health from exposure to potentially contaminated soils will be reduced. The approach to land contamination assessment and proposed remediation strategy has been presented to the key Regulators and NRW, MCC and NCC have all agreed to the approach to the management of land contamination proposed. Furthermore NCC have commented that the scheme is likely to be beneficial in tackling some areas of historic contamination within Newport. NRW have also agreed that provided the principles of the Outline Remediation Strategy Report are carried through to its implementation, any adverse effects on controlled waters could be avoided and the reuse of materials from the TATA Steel Llanwern Steelworks lagoons within the motorway is the most sustainable option.