APPENDIX A GIS LAYERS

Type	Layer	Source	Description of Layer	Included (Y/N)	Comment	Benefits	Limitations
Fluvial	Environment Agency Broad-scale Flood Zone Maps	Provided as GIS layer by EA	Polygon layer showing EA flood zone maps including Flood zone 2 and 3	Y		A quick and easy reference that can be used as an indication of flood risk.	Flood zones may not give an accurate representation of flood risk. The models do not take into account defences; are commonly based on 5m resolution DTM; JFLOW software is commonly used that is generally thought to have inaccuracies. Typically watercourses with a catchment area less than $3km^2$ are omitted from Environment Agency mapping unless there is a history of flooding affecting a population. Consequently there will be some locations adjacent to watercourses that on first inspection, it is suggested there is no flood risk.
	Main River Centrelines	Provided as GIS layer by EA	Polyline layer showing all watercourses designated Main Rivers	Y		Identification of the watercourses for which the EA have discretionary and regulatory powers.	There are other watercourses that may be a significant flood source.
	Hydraulic Model Outputs – Birch Brook Model outlines for 25yr, 100yr and 100yr + Climate Change	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the Birch Brook.	Y	Limited data	Detailed and calibrated hydraulic model outlines that have been mapped using LiDAR (1m and 2m resolution). These outlines provide a much greater degree of accuracy and therefore confidence than the broad-scale flood zones.	There are watercourses that have not been modelled and therefore the flood risk from these can not be as accurately assessed.
	Hydraulic Model Outputs – Blackwater, River Brain, Pods Brook and River Pant Model outlines for 20yr, 100yr and 100yr + Climate Change	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the Blackwater, River Brain, Pods Brook and River Pant.	Y			
	Hydraulic Model Outputs – River Cam and Granta Model outlines for 25yr	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the River Cam and Granta.	Y			
	Hydraulic Model Outputs – Holland Brook Model outlines for 25yr, 100yr and 100yr + Climate Change	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the Holland Brook.	Y			
	Hydraulic Model Outputs – River Lee Model outlines for 20yr, 100yr and 100yr + Climate Change	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the River Lee.	Y			
	Hydraulic Model Outputs – River Slade Model outlines for 25yr, 100yr and 100yr + Climate Change	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the River Slade.	Y			
	Hydraulic Model Outputs – Upper and Middle River Roding Model outlines for 20yr, 100yr and 100yr + Climate Change	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the Upper and Middle River Roding.	Y			
	Hydraulic Model Outputs – Spiketts Brook Model outlines for 25yr, 100yr	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the Spikkets Brook.	Y			

Type	Layer	Source	Description of Layer	Included (Y/N)	Comment	Benefits	Limitations
	Hydraulic Model Outputs – River Stort Model outlines for 20yr, 100yr and 100yr + Climate Change	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the River Stort.	Y			
	Hydraulic Model Outputs – River Chelmer Model outlines for 20yr, 100yr and 100yr + Climate Change	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the River Chelmer.	Y			
	Hydraulic Model Outputs – River Colne Model outlines for 20yr, 100yr	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the River Colne.	Y			
	Hydraulic Model Outputs – Eastwood Brook outlines for 20yr, 100yr, 100yr + Climate Change	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the Eastwood Brook.	Y			
	Hydraulic Model Outputs – Prittle Brook outlines for 20yr, 100yr, 100yr + Climate Change	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the Prittle Brook.	Y			
	Hydraulic Model Outputs – Southchurch Park Watercourse outlines for 20yr, 100yr, 100yr + Climate Change	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the Southchurch Park Watercourse.	Y			
	Hydraulic Model Outputs – River Blackwater outlines for 20yr, 75yr, 100yr, 100yr + Climate Change, 1000yr and 1000yr + Climate Change	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the River Blackwater.	Y			
	Hydraulic Model Outputs – River Chelmer outlines for 10yr, 20yr, 20yr + Climate Change, 50yr, 75yr, 100yr, 100yr + Climate Change, 1000yr and 1000yr + Climate Change	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the River Chelmer.	Y			
	Hydraulic Model Outputs – River Colne outlines for 10yr, 20yr, 50yr, 100yr, 100yr + Climate Change and 1000yr	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the River Colne.	Y			
	Hydraulic Model Outputs – River Stour outlines for 10yr, 20yr, 50yr, 75yr, 100yr, 100yr + Climate Change and 1000yr	Provided as GIS layer by EA	Polyline and polygon data showing the model outlines for the River Stour.	Y			
	Combined Flood Zone 3b – Functional Floodplain	EA Flood Zone Maps & EA Hydraulic Modelled Data	Polygon layer created using best available data for whole district. Where 1:25yr modelled outlines available, these have been used to represent. Where modelled data is not available, EA broad-scale FZ3 has been used.	Y	Combined data	A single GIS layer created using best available information at time of publication.	Assumption made that where modelled data for 20/25yr event is not available, the 100yr FZ3 broad-scale outline has been used. This could be overly conservative and, where possible, data should be updated as and when available.

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	Combined Flood Zone 3a	EA Flood Zone Maps & EA Hydraulic Modelled Data	Polygon layer created using best available data for whole district. Where 1:100yr modelled outlines available, these have been used to represent FZ3a. Where modelled data is not available, EA broad-scale FZ3 has been used.	Y	Combined data	A single GIS layer created using best available information at time of publication.	Assumption made that where modelled data for 100yr event is not available, the 100yr FZ3 broad-scale outline has been used. This could be overly conservative and, where possible, data should be updated as and when available.
	Combined Flood Zone 3 + CC	EA Flood Zone Maps & EA Hydraulic Modelled Data	Polygon layer created using best available data for whole district. Where 1:100yr + CC modelled outlines available, these have been used to represent FZ3 + CC. Where modelled data is not available, EA broad-scale FZ2 has been used.	Y	Combined data	A single GIS layer created using best available information at time of publication.	Assumption made that where modelled data for 100yr+CC event is not available; the 1000yr FZ2 broad-scale outline has been used. This could be overly conservative and, where possible, data should be updated as and when available.
	Combined Flood Zone 2	EA Flood Broad Scale Zone Maps	Polygon layer of 1:1000yr FZ2 outline created for whole district.	Y	Combined data	A single GIS layer created using best available information at time of publication.	All based on FZ2 broad-scale mapping
	Historical Flood Outline	EA Historical Flood Map data.	Polygon data for the whole county showing the combined extents of known flooding from rivers, the sea and groundwater	Y		A single GIS layer created using best available information at time of publication.	Some of the data may be based on circumstantial and subjective evidence. Not all records of flooding will be included.
	Flood Defence Locations	EA flood defence data	Polyline data for the county showing the location of linear raised flood defences such as embankments and walls.	Y	Limited data	Shows where there are existing defences	No metadata behind the data to provide information on height, type and design standard. The National Flood & Coastal Defence Database (NFCDD) has been requested from the EA for the County study area.
Tidal	Environment Agency Broad-scale 200 year flood plain	Provided as GIS layer by EA	polygon layer showing the area that would be expected to flood from the 1 in 200 year still water tidal level assuming no defences	Y		Shows the zones of the study area at risk from the current 1 in 200 year tidal flood	All based on FZ3 broad-scale mapping
	Hydraulic Model Outputs – Breach analysis CH1 Chelmsford Woodham, 20yr, 200yr, 200yr + Climate Change, 1000yr	Provided as GIS layer from the Mid Essex SFRA	Polyline and polygon data showing the model outlines for breach CH1 Chelmsford Woodham	Y		Shows the area at residual risk of flooding from a breach in the defences at Woodham for a number of return periods.	
	Hydraulic Model Outputs – Breach analysis CO1 Colchester Ballast Quay 20yr, 200yr, 200yr + Climate Change, 1000yr	Provided as GIS layer from the Mid Essex SFRA	Polyline and polygon data showing the model outlines for breach CO1 Colchester Ballast Quay	Y		Shows the area at residual risk of flooding from a breach in the defences at Colchester Ballast Quay for a number of return periods.	
	Hydraulic Model Outputs – Breach analysis CO2 Colchester Strood Channel, 20yr, 200yr, 200yr + Climate Change, 1000yr	Provided as GIS layer from the Mid Essex SFRA	Polyline and polygon data showing the model outlines for breach CO2 Colchester Strood Channel	Y		Shows the area at residual risk of flooding from a breach in the defences in the Strood Channel for a number of return periods.	
	Hydraulic Model Outputs – Breach analysis CO3 Colchester Waldegraves Farm, 20yr, 200yr, 200yr + Climate Change, 1000yr	Provided as GIS layer from the Mid Essex SFRA	Polyline and polygon data showing the model outlines for breach CO3 Colchester Waldegraves Farm	Y		Shows the area at residual risk of flooding from a breach in the defences at Waldegraves Farm in Colchester for a number of return periods.	

Type	Layer	Source	Description of Layer	Included (Y/N)	Comment	Benefits	Limitations
Groundwater	Groundwater Vulnerability Maps	Provided as a GIS layer by EA	Polygon layers showing major aquifers and their vulnerability	Y		Broadly shows extents of aquifers in the district. Where aquifers are highly vulnerable, they often have a more permeable covering and, together with dry valley and watercourse networks, potential groundwater flooding areas can be identified.	Coarse assessment of potential areas where GW flooding could occur. This is not foolproof and is based on assumptions. Where necessary, detailed groundwater flooding studies should be undertaken as part of a Site Specific FRA.
	Source Protection Zones	Provided as a GIS layer by EA	Polygon layer showing areas covered by Source Protection Zones for use in identifying where SuDS may be appropriate.	Y		Shows clearly the areas where the groundwater is protected by the Environment Agency.	The designation may not consider fractures in the strata at a greater radius where pollutants could reach the source protection zone.
	Areas Susceptible to Groundwater Flooding Dataset	Provided as a GIS layer by EA	Polygon layers showing the proportion of each 1km square that is susceptible to groundwater emergence. It does not show the likelihood of groundwater flooding occurring.	Y		Provides a broad feel for the areas which might be at risk from groundwater flooding across the study area.	AStGWF is a strategic scale map showing groundwater flood areas on a 1km square grid. It was developed specifically by the EA for use by LLFAs for use in PFRAs as required under the Flood Risk Regulations and so that LLFAs can obtain a broad feel for the wider areas which might be at risk from groundwater flooding. This data has used the top two susceptibility bands of the BGS 1:50,000 Groundwater Flood Susceptibility Map and thus covers consolidated aquifers and superficial deposits. It does not take account of the chance of flooding from groundwater rebound. It shows the proportion of each 1km grid square where geological and hydrogeological conditions show that groundwater might emerge. The susceptible areas are represented by one of four area categories showing the proportion of each 1km square that is susceptible to groundwater emergence. It does not show the likelihood of groundwater flooding occurring. In common with the majority of datasets showing areas which may experience groundwater emergence, this dataset covers a large area of land, and only isolated locations within the overall susceptible area are likely to suffer the consequences of groundwater flooding. The data should not be interpreted as identifying areas where groundwater is actually likely to flow or pond, thus causing flooding, but may be of use to LLFAs in identifying where, for example, further studies may be useful.
Overland Flow	Flood Map for Surface Water	Provided as a GIS layer to ECC by EA	Polygon layers showing areas that are at increased risk of surface water flooding based on broad-scale surface water modelling. Layers are provided showing shallow and deep flooding during the 1 in 30 (3.3% AEP) and 1 in 200 (0.5% AEP) year return period events.	Y	Limited data	Provides an initial indication of areas at risk of surface water flooding, based on an assessment of the topography. Useful for emergency planning procedures.	This map gives an indication of the broad areas likely to be at risk of surface water flooding. It is not suitable for use at an individual property scale due to the method used. Because of the way they have been produced and the fact that the extents are indicative, the Environment Agency surface water flood maps are not appropriate to act as the sole evidence for any specific planning decision (such as objecting to a planning application) at any scale without further supporting studies or evidence. Further information is provided within Chapter 4 of the Main SFRA Report.
	Digital Terrain Model	Provided by EA	Reference Only	Y			SAR 5m DTM
Other	Sewer Flooding History	Records of sewer flooding from Water company records	Point data layer showing points of flooding with incident and source of flooding	Y		Indicates approximate postcode areas that have experienced flooding in the last 10 years due to hydraulic incapacity.	The extent and source of the flooding is not known and cannot be displayed in this layer.
	OS Mapping	ECC provided OS Mapping under contractor license	1:25k and 1:50k OS raster maps for use in GIS	Y		Provides background mapping to other GIS layers.	Designed for use at 1:25k and 1:50k scales
	OS Meridian Dataset	Provided as GIS layers by ECC	Polygon and polyline data of urban areas, road networks, and land use types across the County.	Y		Provide coarse resolution mapping for the whole county study area.	

Type	Layer	Source	Description of Layer	Included (Y/N)	Comment	Benefits	Limitations
Mitigation	Flood Storage Areas	Provided as GIS layer by ECC	Flood storage areas	Y		Clearly defines flood storage areas within the study area.	Land designated and operated to store floodwater are shown in a separate polygon layer.
	Flood Warning Areas	Provided as GIS layer by EA	Polygon layer showing areas benefiting from flood warning and emergency plans with query details presenting what is involved in each.	Y		Indicates which areas are covered by the flood warning system,	
	Areas benefiting from defences	Provided as GIS layer by EA	Polygon layer showing areas benefiting from flood defences	N		Defines land that benefits from the presence of major defences during the 1% fluvial or 0.5% tidal flood event. These are areas that would flood if the defence were not present, but may not flood because the defence is present. Areas benefitting from flood storage areas may be remote from the flood defence structure.	
	Source Protection Zones	From inform provided by EA	Polygon layer showing areas covered by Source Protection Zones for use in identifying where SuDS may be appropriate.	Y		Shows clearly the areas where the groundwater is protected by the Environment Agency.	The designation may not consider fractures in the strata at a greater radius where pollutants could reach the source protection zone.
	Flood Defence Locations	EA flood defence data	Polyline data for the county showing the location of linear raised flood defences such as embankments and walls.	Y	Limited	Shows where there are existing defences	No metadata behind the data to provide information on height, type and design standard. The National Flood & Coastal Defence Database (NFCDD) has been requested from the EA for the County study area.
Planning	ECC/study area Boundary	Provided as GIS Layer by ECC	Polygon layer showing ECC administrative area	Y		Clearly identifies the study boundary	
	Urban Areas	Provided as GIS Layer by ECC	Polygon Layer showing urban areas	Y		Clearly identifies main urban areas in study area	
	OS Mapping	ECC provided OS Mapping under contractor license	1:25k and 1:50k OS raster maps for use in GIS	Y		Provides background mapping to other GIS layers.	Designed for use at 1:25k and 1:50k scales
	Administrative Areas	Provided as GIS Layer by ECC	Polygon GIS layer showing areas administered by each local authority within ECC	Y		Clarifies the administrative areas covering the study area	
	Potential Waste Sites	Provided as GIS Layer by ECC	Polygon GIS layer showing potential waste sites as identified in the Waste Local Plan and Waste Management Plan	Y		Enables mapping of waste sites against flood risk information.	
	Potential Mineral Sites	Provided as GIS Layer by ECC	Polygon GIS layer showing potential mineral sites	Y		Enables mapping of mineral sites against flood risk information.	