Cynllun Datblygu Lleol Sir y Fflint 2015-2030

Datganiad Tir Cyffredin

Cyfoeth Naturiol Cymru (CNC)

Ionawr 2021

CDLl Adnau Sir y Fflint

Datganiad Tir Cyffredin (DTC) Cyfoeth Naturiol Cymru (CNC) a Chyngor Sir y Fflint (y Cyngor neu FCC)

Cyflwyniad

Paratowyd y Datganiad hwn yn sgil sylwadau a wnaed gan CNC i'r CDLl Adnau.

Mae Tabl 1 yn gosod allan sylwadau CNC sy'n codi materion sy'n gysylltiedig â chadernid fel a ganlyn:

i) yr Asesiad Rheoli Cynefinoedd (HRA) a thri pholisi PE2 Prif Ardaloedd Cyflogaeth, PE13 Datblygu Carafannau yng Nghefn Gwlad Agored a PE14 Dyffryn Maes Glas a chais dilynol CNC am newidiadau i EN6
ii) ystyriaethau perygl llifogydd a dau bolisi PE1 Dyraniadau Tir Cyflogaeth Gyffredinol a PE 2 Prif Ardaloedd Cyflogaeth
iii) ystyriaethau perygl llifogydd a pholisi HN8.3 Dyraniad i Sipsiwn yn Riverside, Queensferry
iv) ystyriaethau perygl llifogydd a pholisi HN 1.4 Ffordd Llaneurgain, Y Fflint
v) ystyriaethau perygl llifogydd a pholisi PE12 Llety, Cyfleusterau ac Atyniadau Twristiaid, PE13 Datblygu Carafannau yng Nghefn Gwlad Agored a PE14 Dyffryn Maes Glas
vi) ystyriaethau perygl llifogydd a pholisi EN13.1 Crumps Yard, Cei Connah
vii) EN14 Perygl Llifogydd

Mae Tabl 2 yn gosod allan y sylwadau a gyflwynwyd gan CNC fel 'Materion o Eglurder'. Ym marn CNC, nid oedd y Materion o Eglurder, yn Atodiad 2 o'u hymateb i'r Cynllun Adnau yn bwyntiau o wrthwynebiad, ond mân sylwadau / argymhellion y credai CNC eu bod yn ddefnyddiol. Fodd bynnag, nid oedd y ffurflen i ymgynghori i'r Adnau na'r porthol ymgynghori ar Amcanion yn darparu lle i roi 'sylwadau' ac ym marn y Cyngor, maent wedi cael eu cofnodi'n gywir fel 'gwrthwynebiadau' gan eu bod yn awgrymu newidiadau i bolisïau a geiriad esboniadol. O safbwynt y gwrthwynebiadau hyn, mae'r Cyngor wedi ceisio, lle bo modd, awgrymu newidiadau i'r Cynllun, ond heb geisio mwy o fewnbwn gan CNC ar y newidiadau hyn a awgrymir gan mai dim ond 'sylwadau' oedd y pwyntiau hyn gan CNC yn wreiddiol.

Mae rhifau cyfeirio'r sylwadau parthed y gwrthwynebiadau wedi'u gosod allan yn y tablau manwl isod.

Pwrpas y ddogfen hon

Pwrpas y Datganiad hwn yw gosod allan y trafodaethau rhwng y ddwy ochr a nodi pa sylwadau am bolisïau sydd wedi gallu cael eu datrys a pha rai sydd dal yn disgwyl hynny. Bydd hyn yn darparu datganiad sefyllfa defnyddiol i'r Arolygydd ac yn galluogi trafodaeth wrth Archwilio i roi'r sylw pennaf ar yr anghytundebau sy'n weddill. Mae'r DTC yn seiliedig ar fformat enghreifftiol a awgrymwyd gan CNC a ddefnyddiwyd mewn Archwiliadau blaenorol.

Trosolwg o'r Ymgysylltiad

Ers i Ymgynghoriad y CDLl Adnau ddod i ben, mae'r Cyngor wedi paratoi ymatebion i'r sylwadau a dderbyniwyd. Ochr yn ochr â hyn, aeth gwaith yn ei flaen o ran y gwrthwynebiadau Asesiad Rheoli Cynefinoedd gydag ymgynghorwyr arbenigol y Cyngor, Arcadis, sydd wedi cyd-gysylltu â CNC. O ran y gwrthwynebiadau risg llifogydd i'r safleoedd cyflogaeth a dyraniad Sipsiwn Riverside, cafodd gwaith ei wneud gydag ymgynghorwyr arbenigol y Cyngor, JBA a Weetwood, a chysylltwyd hefyd am y SFCA / FCA / Arfarniadau Perygl Llifogydd a ddiwygiwyd ac a ddiweddarwyd.

Mae'r tablau canlynol yn gosod allan safbwynt CNC ochr yn ochr â safbwynt Cyngor Sir y Fflint yn dilyn cyhoeddi'r Cynllun Datblygu Lleol Adnau. Mae'n gosod y materion fesul pwnc / maes polisi ac yn dangos a gytunwyd ar y mater (gwyrdd), dim cytundeb (coch) neu yn mynd rhagddo (oren). I'r materion sy'n mynd rhagddynt, y bwriad yw parhau i drafod y mater penodol er mwyn ceisio dod i gytundeb.

Tabl 1 – Sylwadau CNC am Faterion Cadernid					
Rhif DTC	Pwnc	Statws (Cytunwyd, Parhaus, Heb Gytuno)	Safbwynt CNC	Safbwynt yr Awdurdod Cynllunio Lleol	Safbwynt Terfynol / Gweithredu sydd ei Angen
Asesiad Rheoli Cynefinoedd (HRA) – Polisi PE2 Prif Ardaloedd Cyflogaeth					
1.1	Pryder fod yr HRA wedi sgrinio'r polisi hwn allan yn rhy gynnar yn y broses Id 1048 re STR13	Cytunwyd	Yn ei ymateb ar y Cynllun Adnau (dyddiedig 11/11/2019) cododd CNC bryderon am y Sgrinio HRA a wnaed. Roedd CNC yn ystyried fod polisi PE2 wedi'i sgrinio allan yn rhy gynnar yn y broses. Cafwyd y cyngor canlynol gan CNC: "*Mae Polisi PE2 yn diffinio ardaloedd lle bydd rhai mathau o ddatblygiad cyflogaeth 'yn cael eu caniatáu'. Felly, mae'n rhaid asesu'r ardaloedd hyn drwy'r broses HRA.* *Cyn y gellir gohirio cynllun i haen is neu i asesiad lefel prosiect, mae gofynion eglur er mwyn gwirio na fyddai unrhyw effaith andwyol ar integredd safle Ewropeaidd (Asesiad Priodol). Fel Awdurdod Cynllunio Lleol, gall y Cyngor ddim ond dibynnu ar fesurau lliniaru mewn cynllun haen is, neu ar lefel prosiect*	Er mwyn datrys y materion hyn, cafwyd trafodaethau rhwng CNC, Arcadis (ymgynghorwyr IIA/HRA y Cyngor) a'r Cyngor ar newidiadau i eiriad rhai o'r polisïau a effeithir gan yr HRA. Cytunwyd ar newidiadau i eiriad Polisi PE2 sy'n sôn yn benodol am osgoi unrhyw effeithiau andwyol ar Safleoedd Ewropeaidd. Mae'r newid hwn yn cryfhau ffocws y polisi drwy amlygu'r problemau posibl ac mae'n helpu i lywio gweithredu'r polisi o safbwynt Safleoedd Ewropeaidd. Cytunodd CNC y bydd y newidiadau hyn yn datrys eu gwrthwynebiad. Mae'r newid i'r polisi fel a ganlyn, wedi'i ddangos mewn coch: **Polisi PE2: Prif Ardaloedd Cyflogaeth** **O fewn prif ardaloedd cyflogaeth, fel y'u diffiniwyd ar y map cynigion a'u rhestru isod, bydd y mathau canlynol o ddatblygiad cyflogaeth yn cael eu caniatáu:**	Mewn e-bost dyddiedig 11.08.2020 dywedodd Arcadis fod cytundeb wedi'i gyrraedd gyda CNC ar y newidiadau i bolisi PE2 fel y dangosir yn y tabl hwn.

			(h.y gohirio) os yw'r tri maen prawf canlynol yn cael eu bodloni: *i. Ni all asesiad y cynllun lefel uwch ragweld yn rhesymol yr effeithiau ar safle Ewropeaidd mewn modd ystyrlon; ond* *ii. Bydd gan y cynllun haen is neu lefel prosiect, a fydd yn adnabod yn fwy manwl natur, amseriad, hyd, graddfa neu leoliad y datblygiad, ac felly ei effeithiau posibl, yr hyblygrwydd angenrheidiol dros union natur, amseriad, hyd, graddfa a lleoliad y cynnig er mwyn gallu osgoi effaith andwyol ar y safle; ac* *iii. Mae gwneud HRA ar y cynllun neu'r prosiect haen is yn ofynnol yn ôl y gyfraith neu bolisi Llywodraeth*" Yn dilyn trafodaethau pellach gyda Chyngor Sir y Fflint, mae'r Cyngor wedi cynnwys geiriad ychwanegol ym mholisi PE2 sy'n ei gwneud yn glir *"Mae'n rhaid i ddatblygiad osgoi effeithiau andwyol ar safleoedd gwarchodedig." Mae hyn yn mynd i'r afael â'n pryderon ac yn galluogi sgrinio polisi PE2 o fewn y Sgrinio HRA.*	**B1 defnydd busnes;** **B2 diwydiant cyffredinol;** **B8 storio a dosbarthu** **cyn belled â bod y cynnig o fath a graddfa addas i'r safle a'i amgylchedd. Mae'n rhaid i'r datblygiad hefyd osgoi effeithiau andwyol ar Safleoedd Ewropeaidd.** Cytunwyd ar y newid hwn gan CNC drwy e-bost ar 11/08/2020 Yng ngoleuni'r newid hwn, paratowyd HRA diwygiedig sydd i'w weld yn Atodiad 1.	
Asesiad Rheoli Cynefinoedd (HRA) - Polisi PE13 Datblygu Carafannau yng Nghefn Gwlad Agored					
1.2	Pryder fod yr HRA wedi sgrinio'r polisi hwn allan yn	Cytunwyd	Yn ei ymateb ar y Cynllun Adnau, cododd CNC bryderon am y Sgrinio HRA a wnaed. Roedd CNC yn ystyried fod polisi PE13 wedi'i sgrinio	Er mwyn datrys y materion hyn, cafwyd trafodaethau rhwng CNC, Arcadis (a'r Cyngor ar	Mewn e-bost dyddiedig 11.08.2020 dywedodd Arcadis fod cytundeb wedi'i gyrraedd gyda

	rhy gynnar yn y broses Id 1048 re STR13		allan yn rhy gynnar yn y broses. Cafwyd y cyngor canlynol gan CNC: "*Mae polisïau PE13 a PE14 yn rhoi sicrhad fod yn rhaid rhoi ystyriaeth briodol i nodweddion 'cadwraeth natur' mewn unrhyw gais yn y dyfodol. Fodd bynnag, mae'r ardaloedd a ddiffinnir gan y polisïau hyn yn gorwedd oddi mewn a nesaf at y safleoedd gwarchodedig, ac oherwydd hynny, credwn na allant gael eu sgrinio allan o'r HRA mor gynnar â hyn".* Yn dilyn trafodaethau pellach gyda FCC, mae FCC wedi cynnwys geiriad ychwanegol ym mholisi PE13 sy'n ei gwneud yn glir fod yn rhaid i ddatblygiad osgoi effeithiau andwyol ar safleoedd gwarchodedig. Mae hyn yn mynd i'r afael â'n pryderon ac yn caniatáu i bolisi PE13 gael ei sgrinio allan o fewn Sgrinio'r HRA.	newidiadau i eiriad rhai o'r polisïau a effeithir gan yr HRA. Cytunwyd ar newidiadau i eiriad polisi PE13 sy'n datgan yn benodol y bydd datblygu llety i garafannau sefydlog ond yn cael ei ganiatáu lle nad oes effeithiau andwyol ar Safleoedd Ewropeaidd. Mae'r newid hwn yn cryfhau ffocws y polisi drwy dynnu sylw at y problemau posibl ac mae'n helpu i lywio gweithredu'r polisi mewn perthynas â Safleoedd Ewropeaidd. Cytunodd CNC y bydd y newidiadau hyn yn datrys eu gwrthwynebiad. Mae'r newid i'r polisi fel a ganlyn, wedi'i ddangos mewn coch: **''PE13: Datblygu Carafannau yng Nghefn Gwlad Agored** **a. Bydd datblygu safle i garafannau sefydlog yn cael ei ganiatáu y tu allan i ardal Talacre, Gronant a Gwesbyr (fel y diffinnir ar y map cynigion lle:** **i. ni fyddai niwed sylweddol i gymeriad y tirlun ac ansawdd amgylcheddol yr ardal o gwmpas a dim effaith andwyol ar Safleoedd Ewropeaidd, naill ai'n unigol neu'n gronnol gyda safleoedd eraill yn y cyffiniau;"** **ac yn meini prawf c, maen prawf newydd fel a ganlyn:** **'vi nid yw'r cynnig yn cael unrhyw effeithiau andwyol ar safleoedd Ewropeaidd'.** Yng ngoleuni'r newid hwn, paratowyd HRA diwygiedig sydd i'w weld yn Atodiad 1.	CNC ar y newidiadau i bolisi PE13 fel y dangosir yn y tabl hwn.

Asesiad Rheoli Cynefinoedd (HRA) – Polisi PE14 Dyffryn Maes Glas					
1.3	Pryder fod yr HRA wedi sgrinio'r polisi hwn allan yn rhy gynnar yn y broses Id 1048 re STR13	Cytunwyd	Yn ei ymateb ar y Cynllun Adnau, cododd CNC bryderon am y Sgrinio HRA a wnaed. Roedd CNC yn ystyried fod polisi PE14 wedi'i sgrinio allan yn rhy gynnar yn y broses. Cafwyd y cyngor canlynol gan CNC: Yn dilyn trafodaethau pellach gyda FCC, mae FCC wedi cynnwys geiriad ychwanegol ym mholisi PE14 sy'n ei gwneud yn glir fod yn rhaid i ddatblygiad osgoi effeithiau andwyol ar safleoedd gwarchodedig. Mae hyn yn mynd i'r afael â'n pryderon ac yn caniatáu i bolisi PE14 gael ei sgrinio allan o fewn Sgrinio'r HRA.	Er mwyn datrys y materion hyn, cafwyd trafodaethau rhwng CNC, Arcadis a'r Cyngor ar newidiadau i eiriad rhai o'r polisïau a effeithir gan yr HRA. Cytunwyd ar newidiadau i eiriad Polisi PE14 sy'n datgan yn benodol fod yn rhaid osgoi effeithiau andwyol ar Safleoedd Ewropeaidd o fewn Dyffryn Maes Glas neu nesaf ato. Mae'r newid hwn yn cryfhau ffocws y polisi drwy amlygu'r problemau posibl ac yn helpu i lywio gweithredu'r polisi mewn perthynas â Safleoedd Ewropeaidd. Cytunodd CNC y bydd y newidiadau hyn yn datrys eu gwrthwynebiad. Mae'r newid i'r polisi, fel a ganlyn, wedi'i ddangos mewn coch :- **''PE14: Dyffryn Maes Glas** **Bydd cynigion datblygu o fewn Dyffryn Maes Glas neu nesaf ato, fel y dynodwyd ar y map cynigion, yn cael eu caniatáu lle nad ydynt yn tynnu oddi ar botensial twristiaeth y Dyffryn neu'n niweidio ardaloedd neu nodweddion y tirwedd, cadwraeth natur neu werth hanesyddol. O fewn Dyffryn Maes Glas neu nesaf ato, mae'n rhaid i ddatblygiadau hefyd osgoi effeithiau andwyol ar Safleoedd Ewropeaidd.''** Cytunwyd ar y newid hwn gan CNC mewn e-bost ar 11/08/2020 Yng ngoleuni'r newid hwn, paratowyd HRA diwygiedig sydd i'w weld yn Atodiad 1.	Mewn e-bost dyddiedig 11.08.2020 dywedodd Arcadis fod cytundeb wedi'i gyrraedd â CNC ar y newidiadau i Bolisi PE14 fel y dangosir yn y tabl hwn.

Asesiad Rheoli Cynefinoedd (HRA) – Polisi EN6 Safleoedd o Bwysigrwydd Bioamrywiaeth					
1.4	Pryder fod angen cryfhau'r polisi ochr yn ochr â'r newidiadau polisi eraill	Cytunwyd	Nid oedd y mater hwn yn rhan o wrthwynebiad gwreiddiol i'r CDLl Adnau gan CNC ond daeth i'r amlwg fel mater wrth i drafodaethau am Bolisïau PE2, PE13 a PE14 fynd rhagddynt. Roedd CNC yn ystyried fod angen newid geiriau ym mholisi EN6 hefyd er mwyn cryfhau ffocws y polisi a sicrhau gweithredu cyson drwy'r cynllun. Yn ogystal, sicrhau ei fod yn cyd-fynd â Chynllun Cenedlaethol Cymru'r Dyfodol yn ogystal â PPW 10. Yn dilyn cyfarfod ar 2/10/20, cynigiodd FCC eiriad newydd i bolisi EN6. Mae'r geiriad newydd yn mynd i'r afael â phryderon CNC.	Er mwyn datrys y mater, cafwyd trafodaethau rhwng CNC, Arcadis a'r Cyngor ar newidiadau i'r geiriad a daethpwyd i gytundeb. Er mwyn dilyn y cyd-destun a roddwyd gan ganllawiau Llywodraeth Cymru ar Gynllun Cenedlaethol Cymru'r Dyfodol, mae'r mân newidiadau i Bolisi EN6 fel a ganlyn:- ~~'Development likely to significantly affect any site of international importance, either alone or in combination with other plans or projects, will be subject to a Habitats Regulations Assessment (HRA). Development will only be permitted where it is possible to ascertain no adverse effect on the integrity of the Site or where there are no alternative solutions, Imperative Reasons of Overriding Public Interest and compensatory measures are secured.~~ **Ni fydd datblygiadau'n cael eu caniatau a fyddai'n arwain at effaith andwyol ar integredd safleoedd o bwysigrwydd cadwraeth natur ryngwladol, ac eithrio o dan yr amgylchiadau a bennwyd mewn deddfwriaeth berthnasol. Ni fyddai cynigion lle na ellir sicrhau na fydd effeithiau andwyol ar integredd safle yn cael eu cefnogi.** Dim ond mewn amgylchiadau eithriadol y rhoddir caniatâd i ddatblygiadau sy'n debygol o effeithio ar nodweddion arbennig Safle Dynodedig Cenedlaethol, a hynny lle gellir digolledu'n briodol. Bydd cynigion datblygu a fyddai'n cael effaith andwyol sylweddol ar safleoedd dynodedig lleol neu safleoedd o ddiddordeb bioamrywiaeth a / neu ddaearegol arall, yn cynnwys rhywogaethau blaenoriaeth, ond yn cael eu caniatau lle:	Anfonwyd e-bost dyddiedig 07.10.2020 i Arcadis yn dweud fod cytundeb wedi'i gyrraedd â CNC ar y newidiadau i Bolisi EN 6 fel y dangosir yn y tabl hwn.

				1. gellir dangos fod yr angen am ddatblygiad yn drech na phwysigrwydd bioamrywiaeth neu ddaearegol y safle; ac 2. y gellir dangos na all y datblygiad gael ei leoli yn rhesymol yn unrhyw le arall; a 3. bod unrhyw niwed na ellir mo'i osgoi yn cael ei leihau gan gamau lliniaru effeithiol i sicrhau nad oes gostyngiad yng ngwerth bioamrywiaeth gyffredinol yr ardal. Os nad yw hyn yn ymarferol, rhaid darparu mesurau digolledu i greu, adfer a gwella bioamrywiaeth. Bydd datblygiadau sy'n arwain at adfer, gwella a chreu cynefinoedd yn cael eu cefnogi yn enwedig lle mae hyn yn hybu gwydnwch ecosystemau." Yng ngoleuni'r newid hwn, paratowyd HRA diwygiedig sydd i'w weld yn Atodiad 1.	

Perygl Llifogydd – Polisi PE1 Dyraniadau Tir Cyflogaeth Gyffredinol					
1.5	Pryderon am nifer o ddyraniadau cyflogaeth gan eu bod mewn ardaloedd o berygl llifogydd, ond heb eu hasesu'n briodol drwy gyfrwng Asesiad Canlyniadau Llifogydd (FCA). Id1052	Cytunwyd	Yn dilyn ymgynghoriad ar y cynllun adnau, dywedodd CNC fod ganddo bryderon am nifer o safleoedd a ddyrannwyd o dan y polisi hwn gan eu bod mewn ardaloedd o berygl llifogydd. Nid oedd yr FCA Strategol wedi dangos fod canlyniadau llifogydd wedi cael eu deall ac y byddent yn gallu cael eu rheoli mewn ffordd dderbyniol. Roedd y pryderon yn ymwneud â'r safleoedd canlynol ac fe'u gwelir yn Atodiad 2: • PE1.1 Manor Lane, Parc Awyrofod Caer, Brychdyn • PE1.2 Manor Lane, Estyniad Parc Penarlâg, Brychdyn • PE1.4 Parc Busnes Maes Glas, Cam 1, Maes Glas • PE1.5 Parc Busnes Maes Glas, Cam III, Maes Glas • PE1.6 Ystad Ddiwydiannol Broncoed, Yr Wyddgrug • PE1.8 Cyffinio â Dociau Mostyn, Mostyn • PE1.9 Chester Rd East, Queensferry	Mae'r Cyngor yn pwysleisio nad yw'r Cynllun yn dibynnu ar bob dyraniad cyflogaeth PE1 yn cael eu datblygu. Mae'r Cynllun wedi adnabod portffolio o dir cyflogaeth er mwyn cynnig hyblygrwydd o ran lleoliad, math a maint y safle i fodloni gofynion gwahanol ddatblygiadau cyflogaeth. Yn wahanol i ddyraniadau tai'r Cynllun (y mae'n rhaid gallu eu cyflawni i fodloni'r gofyniad tai) mae mwy o safleoedd cyflogaeth nag o angen cyflogaeth, ac felly portffolio yw hwn o ddewis o lefydd i fuddsoddi. Golyga hyn y gellir ystyried risg llifogydd a hyfywedd a'r gallu i gyflawni ac os nad yw'n hyfyw, mae dewisiadau eraill ar gael. Daw'r dull hwn o PPW 10 lle mae'n dweud ym mharagraff 5.4.1 . At ddibenion cynllunio, mae Llywodraeth Cymru yn diffinio datblygu economaidd fel datblygu tir ac adeiladau ar gyfer gweithgareddau cynaliadwy sy'n creu ffyniant, swyddi ac incwm tymor hir". **Dylai'r system gynllunio sicrhau nad yw twf cynnyrch a chyflogaeth yng Nghymru yn cael ei gyfyngu gan brinder tir at ddefnyddiau economaidd.** Mae'n mynd ymlaen yn 5.4.3 "Dylai awdurdodau cynllunio roi eu cefnogaeth i ddarparu digon o dir i gwrdd ag anghenion y farchnad gyflogaeth ar lefel strategol a lleol. Dylai cynlluniau datblygu nodi'r gofyn am dir cyflogaeth, **dyrannu cymysgedd priodol o safleoedd i ateb y galw a llunio**	

			• PE1.10 Ystad Ddiwydiannol Antelolpe, Rhyd-y-mwyn • PE1.12 Rhodfa Rowley, Shotton	**fframwaith ar gyfer dioeglu safleoedd cyflogaeth o bwys strategol a lleol**." Dyna'n union y mae polisi PE1 ("dyrannu cymysgedd priodol o safleoedd") yn ceisio'i wneud. Mae'r Cyngor wedi cynnig y geiriad diwygiedig canlynol ar ddiwedd paragraff 10.1: '***Bydd unrhyw gynigion datblygu ar safleoedd a all fod wedi'u lleoli mewn parth perygl llifogydd sy'n achosi cyfyngiad, yn gofyn am archwiliad pellach o ran, i ddechrau, osgoi perygl llifogydd drwy fesurau cynllunio a dylunio ac yn ail, drwy FCA manwl penodol i'r safle yn y cam rheoli'r datblygiad. Nid yw'r SFCA a wnaed o ran y dyraniadau a'r ardaloedd cyflogaeth yn asesu pob dyraniad yn fanwl gan mai dim ond fel rhan o'r camau rheoli dyluniad a datblygiad y prosiect y gellir gwneud hyn. Mae hyn yn ceisio sicrhau y gellir osgoi ardaloedd mewn perygl llifogydd ac y gellir rhoi camau lliniaru yn eu lle i fynd i'r afael â risg llifogydd a chydymffurfio â'r polisi perygl llifogydd perthnasol a pholisi EN14'.*** Mae'r Cyngor hefyd wedi diweddaru ei SFCA o ran y safleoedd a adnabuwyd gan CNC. Mae hwn yn gosod allan Argymhelliad Strategol A i gael mwy o dystiolaeth, archwiliad neu osgoi parthau risg llifogydd, ar y cam rheoli datblygiad.	

1.5.1			Ymgynghorwyd â CNC ar SFCA wedi'i ddiweddaru (dyddiedig Gorffennaf 2020). Yn eu hymateb dyddiedig 21/08/20 mae CNC yn cadarnhau fod ganddynt bryderon sylweddol o hyd am gadernid y Cynllun fel y'i cyflwynwyd. Mae pryderon penodol CNC yn gysylltiedig â'r dyraniadau PE1 mewn ardaloedd perygl llifogydd. Nid oedd CNC yn ystyried fod lefel yr asesu yn yr SFCA yn ddigonol i ddangos fod canlyniadau llifogydd yn y dyraniadau PE1 yn gallu cael eu rheoli mewn ffordd dderbyniol. Rhoddodd CNC sylwadau manwl am bob un o ddyraniadau safle PE1 oedd yn achosi pryder - gweler Atodiad 4.	Mae'r Cyngor wedi ailymweld â'r SFCA o safbwynt y safleoedd sy'n pryderu CNC a gellir gweld hwn fel un o'r dogfennau cyflwyno LDP-EBD-EN2. Fodd bynnag, nid ystyrir y gellir, yn y cam cynllunio strategol, heb gynlluniau arfaethedig neu brif gynllun i bob safle, wneud FCA manwl nac adnabod datrysiadau ac opsiynau lliniaru penodol. Ystyrir ei bod yn fwy priodol ymgymryd â'r lefel yma o fanylder yn y cam rheoli'r datblygiad, yn enwedig pan mae'n ymwneud â safleoedd cyflogaeth gwendid isel. Os yw FCA dilynol yn dangos wedyn yn ddiamwys am y safle ac mewn llefydd eraill na ellir rheoli'r risg yn briodol i alluogi datblygu cynaliadwy heb gynyddu'r risg mewn lle arall, yna dylid gwrthod y cais.	
1.5.2			Ar 10/12/20 ymgynghorwyd â CNC ar wybodaeth bellach am y safleoedd PE1 (Arfarniad Perygl Llifogydd - FRA), JBA Consulting, Tach. 2020) Yn dilyn adolygu'r FRA, cadarnhaodd CNC y canlynol yn ei ymateb dyddiedig 4/1/21: • I safleoedd PE1.1 a PE1.2, mae CNC yn fodlon fod yr Arfarniad Perygl Llifogydd wedi dangos fod canlyniadau llifogydd wedi cael	Mewn ymateb i sylwadau pellach CNC, oedd yn cynnal eu gwrthwynebiadau i nifer o ddyraniadau cyflogaeth, comisiynodd y Cyngor JBA Consultants i wneud Arfarniad Perygl Llifogydd unigol i bob safle. Nid yw hyn yn cynrychioli FCA llawn gan nad oes cynigion datblygu manwl eto. Yn hytrach, roedd yn golygu asesiad yn seiliedig ar dybiaethau am y datblygiad tebygol ar safleoedd o'r fath h.y. 1/3 datblygiad adeiledig, 1/3 llawr caled ac 1/3 tirlunio. Gellir gweld yr Arfarniadau Perygl Llifogydd yn Atodiad 3 ac fe'u hanfonwyd ymlaen i CNC eu hystyried ar 10/12/20.	O ganlyniad i'r Arfarniadau Perygl Llifogydd safle-benodol, cynigir fod y safleoedd canlynol yn cael eu dileu o'r Cynllun: PE1.4 Parc Busnes Maes Glas Cam II PE1.5 Parc Busnes Maes Glas Cam III

			eu deall ac y byddent yn gallu cael eu rheoli mewn ffordd dderbyniol. • O ran safleoedd PE1.4, PE1.5, PE1.8 a PE1.12, rydym yn cytuno â chasgliadau'r FRA nad oes modd dangos fod canlyniadau llifogydd yn y safleoedd hyn yn gallu cael eu rheoli mewn ffordd dderbyniol. Mae'r adroddiad yn argymell nad yw'r safleoedd hyn yn cael eu dyrannu. Yn y SoCG drafft a dderbyniwyd ar 18/12/20, mae FCC yn datgan y bydd y safleoedd hyn yn cael eu tynnu o'r Cynllun. Cadarnhaodd CNC, yn seiliedig ar dynnu'r rhain, y byddent felly yn dileu eu gwrthwynebiad i safleoedd PE1.4, PE1.5, PE1.8 a PE1.12. • O ran safleoedd PE1.6 a PE1.10, cadarnhaodd CNC, yn seiliedig ar yr wybodaeth a ddarparwyd, fod ganddo bryderon sylweddol o hyd am ddyraniadau safle PE1.6 a PE1.10. Ar 5/1/21, cadarnhaodd FCC (ebost gan Adrian Walters), yn dilyn ystyried pryderon CNC ar safleoedd 1.6 a 1.10, y byddai'r safleoedd hyn yn cael eu dileu o'r Cynllun. Yn seiliedig ar eu dileu o'r Cynllun, byddem felly yn tynnu ein gwrthwynebiad i safleoedd PE1.6 a PE1.10. I grynhoi, nid yw CNC yn gwrthwynebu dyrannu safleoedd PE1.1 a PE1.2. Mae Cyngor Sir y	Gellir crynhoi'r canlyniadau fel a ganlyn o safbwynt a yw pob safle yn **addas** i gael ei ddyrannu: PE1.1 Manor Lane, Parc Awyrofod Caer – YDI (Cadw'r dyraniad) PE1.2 Manor Lane, Estyniad Parc Penarlâg – YDI (Cadw'r dyraniad) PE1.4 Parc Busnes Maes Glas Cam II – NAC YDI) (Dileu'r dyrniad) PE1.5 Parc Busnes Maes Glas Cam III – NAC YDI) (Dileu'r dyrniad) PE1.6 Ystad Ddiwydiannol Broncoed- YDI (Cadw'r dyraniad) PE1.8 Cyffinio â Dociau Mostyn – NAC YDI – angen modelu pellach (Dileu'r Dyraniad) PE1.10 Ystad Ddiwydiannol Antelope – (Efallai) PE1.12 Rhodfa Rowley, Shotton – NAC YDI (Dileu'r dyraniad) Yn dilyn ymgynghoriad â CNC ac ystyried sylwadau CNC, cynigir fod: • PE1.6 Ystad Ddiwydiannol Broncoed yn cael ei ddileu • PE1.10 Ystad Ddiwydiannol Antelope yn cael ei ddileu.	PE1.6 Ystad Ddiwydiannol Broncoed PE1.8 Cyffinio â Dociau Mostyn PE1.10 Ystad Ddiwydiannol Antelope PE1.12 Rhodfa Rowley, Shotton

			Fflint wedi cadarnhau y bydd y safleoedd eraill sy'n achosi pryder (PE1.4, PE1.5, PE1.6, PE1.8, PE1.10 a PE1.12) yn cael eu dileu o'r Cynllun. Mae CNC yn fodlon felly fod cytundeb yn y mater hwn.		

Perygl Llifogydd – Polisi PE2 Prif Ardaloedd Cyflogaeth					
1.6	Pryderon am nifer o ddyraniadau cyflogaeth gan eu bod mewn ardaloedd o berygl llifogydd, ond heb eu hasesu'n briodol drwy gyfrwng Asesiad Canlyniadau Llifogydd (FCA). Id1053	Cytunwyd	Yn ei ymateb i'r Cynllun Adnau, cododd CNC bryderon am Bolisi PE2. Mae'r polisi hwn yn diffinio "ardaloedd" lle pennir y caniateir mathau datblygiad B1, B2 a B3. Fodd bynnag, nid oedd hi'n ymddangos fod yr ardaloedd hyn wedi cael eu hasesu'n ddigonol o safbwynt Perygl Llifogydd. Nid oedd CNC yn glir a yw'r rhain yn "ddyraniadau" Cynllun lle byddai angen i TAN15 Adran 10 fod yn weithredol. Mae CNC yn cydnabod y gall fod mai bwriad PE2 yw gwarchod/diogelu safleoedd sy'n bodoli'n barod yn hytrach na dyrannu tir ac felly dylai'r Cynllun fod yn gliriach ac yn benodol dylai fod yn bolisi seiliedig ar feini prawf sy'n cynnwys cyfeiriadau at risg llifogydd ar safle a'r angen i ddangos gallu i dderbyn canlyniadau llifogydd. Yn dilyn cyfarfod â FCC ar 6/8/20, cadarnhaodd CNC yn ei ymateb (21/8/20) ei fod yn fodlon â'r eglurhad a roddwyd ar bwrpas polisi PE2. Nodwn mai bwriad polisi PE2 yw "darparu fframwaith i ddiogelu'r	Nid nod Polisi PE2 yw 'dyrannu' tir ar gyfer datblygiadau cyflogaeth yn benodol. Yn hytrach, mae'n ceisio adnabod a diffinio ardaloedd o ddatblygiad cyflogaeth sydd eisoes yn bodoli yn y Sir. Mae'r polisi yn diogelu defnyddiau cyflogaeth o'r fath drwy wrthwynebu defnyddiau eraill a hefyd caniatáu, lle'n briodol, datblygiadau cyflogaeth pellach ar ffurf ailddatblygu, ymestyn neu mewn rhai achosion datblygiad newydd. Er mwyn egluro bwriad ac ystyr y polisi ymhellach, e-bostiwyd y newidiadau canlynol i CNC ar 22/07/2020: Geiriad Polisi Diwygiedig: O fewn y prif ardaloedd cyflogaeth, fel y'u diffinnir ar y map cynigion a'u rhestru isod, bydd y mathau canlynol o ddatblygiad cyflogaeth yn cael eu caniatáu: • B1 defnydd busnes; • B2 diwydiant cyffredinol; • B8 storio a dosbarthu cyn belled â bod y cynnig o fath a graddfa addas ar gyfer y safle a'i amgylchedd ac yn bodloni polisïau eraill y Cynllun. O fewn yr ardaloedd hyn, mae'n rhaid i'r datblygiadau hefyd osgoi effeithiau andwyol ar Safleoedd Ewropeaidd. Bydd unrhyw gynigion datblygu ar safleoedd a all fod wedi'u lleoli mewn parth perygl llifogydd sy'n achosi cyfyngiad, yn gofyn am archwiliad pellach o ran, i	Mewn llythyr dyddiedig 21/08/20, cadarnhaodd CNC fod y geiriad newydd a awgrymir i bolisi PE2 a'i destun esboniadol yn dderbyniol *'mewn perthynas â PE2, nodwn yr eglurhad pellach ar bwrpas y polisi hwn a'r geiriad diwygiedig fel y nodwyd yn eich e-bost dyddiedig 22 Gorffennaf 2020. Fel yr esbonnir yn adran 2 isod, nid ydym yn gwrthwynebu cynnwys polisi PE2 gyda'r geiriad diwygiedig'* Nododd CNC un mân newid pellach yng ngeiriad y polisi drwy dynnu 'ac yn bodloni polisïau eraill y Cynllun' ac mae hyn yn dderbyniol i'r Cyngor.

			safleoedd cyflogaeth sy'n bodoli'n barod o bwysigrwydd strategol a lleol. Yn ei ymateb ar 21/8/20, rhoddodd CNC y cyngor canlynol hefyd: "*Rydym hefyd yn croesawu'r geiriad diwygiedig fel y cynigiwyd yn eich e-bost ar 22 Gorffennaf 2020. Mae'r testun ychwanegol a roddwyd yn cyfeirio'n glir at bolisi EN14 Perygl Llifogydd. Mae cynnwys polisi EN14 yn sicrhau na fyddai datblygiad yn cael ei ganiatáu oni ellir dangos yn y cam rheoli datblygu fod y cynnig yn cydymffurfio â TAN15.* *Er mai pwrpas polisi PE2 yw gwarchod safleoedd cyflogaeth sy'n bodoli'n barod, gall y polisi arwain at gynigion (e.e. datblygiadau newydd neu estyniadau i rai presennol) yn cael eu cyflwyno o fewn ardaloedd perygl llifogydd. Dylid nodi fod rhai Prif Ardaloedd Cyflogaeth mewn ardaloedd perygl llifogydd lle gall nad oes modd i gynigion newydd ddangos cydymffurfiaeth â TAN15. Fodd bynnag, nodwn fod PE2 yn gwarchod safleoedd cyflogaeth sy'n bodoli'n barod ac y bydd polisi PE14 yn sicrhau fod yn rhaid i unrhyw ddatblygiad gydymffurfio â TAN15. Yng ngoleuni'r uchod, nid ydym felly yn gwrthwynebu cynnwys polisi PE2".* I grynhoi, nid yw CNC yn gwrthwynebu cynnwys Polisi PE2 ac felly cafwyd cytundeb ar y mater hwn.	ddechrau, osgoi perygl llifogydd drwy fesurau cynllunio a dylunio ac yn ail, drwy FCA manwl penodol i'r safle yn y cam rheoli'r datblygiad Geiriad y Testun Esboniadol diwygiedig: 10.3 Drwy bolisi PE2, ystyrir drwy nodi'r ardaloedd allweddol lle gellir diogelu yn bennaf y datblygiadau cyflogaeth presennol, bydd hyn yn dderbyniol yn gyffredinol. Nod y Cynllun yw rhoi mwy o sicrwydd a chysondeb ac osgoi'r angen i adnabod nifer o ddyraniadau neu ymrwymiadau bach. Mae'r polisi yn weithredol i ddefnydd tir, adeiladau newydd, trosi, ailddatblygu ac ymestyn neu ehangu. Yn yr ardaloedd hyn, bydd datblygiadau cyflogaeth yn dderbyniol yn gyffredinol, oni eu bod wedi'u clustnodi ar gyfer defnydd arbennig drwy bolisi arall. Fodd bynnag, bydd dal fod angen i gynigion fod o fath a graddfa sy'n parchu'r amgylchedd lleol ac amwynder defnyddiau tir eraill a'r preswylwyr ac yn bodloni polisïau eraill drwy gydol y Cynllun. Yn arbennig, mae'n rhaid i gynigion datblygu ddangos yn y cam cais cynllunio sut y gellir asesu ystyriaethau perygl llifogydd yn llawn drwy fwy o asesu manwl. Mae'r SFCA a wneir i'r Prif Ardaloedd Cyflogaeth yn asesiad lefel uchel ac nid yw'n asesu pob ardal yn fanwl gan mai dim ond fel rhan o ystyried cynigion datblygu unigol fel rhan o'r camau rheoli dyluniad a datblygiad y prosiect y gellir gwneud hyn. Nod hyn yw sicrhau y gellir osgoi ardaloedd o berygl llifogydd, o ddewis, ac y gall mesurau lliniaru gael eu rhoi yn eu lle i fynd i'r afael â pherygl llifogydd a chanlyniadau llifogydd, cydymffurfio â'r polisi cenedlaethol ar berygl llifogydd a pholisi EN14.	Ystyrir fod pryderon CNC am bolisi PE2 o safbwynt perygl llifogydd wedi cael eu datrys, yn amodol ar ystyriaeth yr Arolygydd.

				Mae'r Cyngor hefyd wedi diweddaru ei SFCA o ran y safleoedd a adnabuwyd gan CNC. Mae hwn yn gosod allan Argymhelliad Strategol A i gael mwy o dystiolaeth, archwiliad neu osgoi parthau risg llifogydd, ar y cam rheoli datblygiad.	

Perygl Llifogydd – HN8.3 Dyraniad Sipsiwn Riverside, Queensferry					
1.7	Pryderon am ddatblygiad agored iawn i niwed a lleoliad y safleoedd ym mharth 1. Id1057	Cytunwyd		Gwnaeth ymgynghorwyr y Cyngor FCA (Hydref 2019) a oedd yn argymell: 'Mae'r adroddiad hwn wedi dangos y gellir cwblhau'r datblygiad a gynigir yn unol â gofynion y polisi cynllunio yn amodol ar y canlynol: • Lefel y llwyfan datblygu i'w osod ar isafswm o 7.24 m AOD • Lefelau gorffenedig y lloriau i'w gosod 0.15m uwchben lefel y llwyfan datblygu • Cynllun Llifogydd i'w ddatblygu mewn ymgynghoriad â Chyngor Sir y Fflint • Y cynllun draenio manwl i'w gyflwyno a'i gymeradwyo gan yr awdurdod cynllunio lleol cyn dechrau'r datblygiad'. Yn dilyn ymgynghoriad â CNC ar yr FCA, cadarnhaodd CNC fod ganddynt bryderon o hyd. Adolygodd Weetwood y sylwadau ac ymddangosai fod y gwrthwynebiad yn gysylltiedig ag un pryder am risg uwch o lifogydd yn rhywle arall yn ystod senario llifogydd llanwol oherwydd codi'r llwyfan datblygu. Mae Weetwood wedi gwneud gwaith pellach ar ffurf FCA diwygiedig (Atodiad 5) ac wedi adnabod darn o dir ym mherchnogaeth y Cyngor nesaf at yr estyniad a ddyrannwyd a allai gael ei ddatblygu fel cynllun cyfadferol i storio dŵr llifogydd.	At ddiben dyrannu'r safle o fewn y Cynllun Datblygu Lleol (CDLl) sydd i'w gyhoeddi, mae CNC yn fodlon fod yr FCA wedi dangos y gellir rheoli'r perygl o lifogydd yn rhywle arall i lefel dderbyniol

			Ymgynghorwyd â CNC wedyn ar FCA wedi'i ddiweddaru, a oedd wedi adnabod darn o dir ym mherchnogaeth y Cyngor nesaf at yr estyniad a ddyrannwyd a allai gael ei ddatblygu fel cynllun cyfadferol i storio dŵr llifogydd. Yn dilyn adolygu'r FCA a ddiweddarwyd, cadarnhaodd CNC ei fod yn fodlon bod yr FCA wedi dangos y gellir rheoli'r perygl o lifogydd yn rhywle arall i lefel dderbyniol. Rydym felly yn tynnu'n gwrthwynebiad i ddyraniad y safle hwn yn y CDLl. Felly mae cytundeb ar y mater hwn.		

Perygl Llifogydd – HN1.4 Ffordd Llaneurgain, Y Fflint					
1.8	Mae dyraniad tai HN1.4 Ffordd Llaneurgain, Y Fflint yn ymestyn i ardal o Barth C2 Perygl Llifogydd id1073	Cytunwyd	Yn ei ymateb ar y Cynllun Adnau, dywedodd CNC (mewn perthynas â HN1.4 - Ffordd Llaneurgain) ei bod yn ymddangos fod anghysondeb gyda ffin y dyraniad a Pharth Llifogydd C2, gyda ffin y dyraniad yn gorgyffwrdd darn bach o barth llifogydd C2. Mae'n bosibl fod hyn wedi codi'n barod drwy ddiweddariadau map diweddar. Awgrymon ni fod hyn yn cael ei archwilio ac os oes angen, newid ffiniau'r dyrannid i gael gwared ar ddyraniad HVD o C2. Yn e-bost 18/12/20, cadarnhaodd FCC fod y ffin wedi cael ei newid i osgoi'r amlinelliad C2. Yn seiliedig ar y ffaith fod y dyraniad y tu allan i amlinelliad C2, ni fyddai CNC yn gwrthwynebu'r dyraniad hwn.	Gan mai dim ond rhan fechan o'r safle sydd ym Mharth perygl llifogydd C2, cynigir felly ail-lunio llinell y dyraniad i eithrio ardal Parth C2 a sicrhau na fydd unrhyw ddatblygiad oddi mewn i ardal perygl llifogydd. Gellir ystyried hwn yn fân newid.	Mân newid i ffin HN1.4 i adlewyrchu'r mapiau perygl llifogydd diweddaraf fel y dangosir yn Atodiad 6 y mae CNC yn fodlon ag ef.
Perygl Llifogydd – PE12 Llety, Cyfleusterau ac Atyniadau Twristiaid					
1.9	Pryder am ddynodi darnau mawr o dir ar gyfer datblygiad twristiaeth	Cytunwyd	Yn ei ymateb ar y Cynllun Adnau, dywedodd CNC: "*Mae'r polisïau hyn yn dynodi darnau mawr o dir fel rhai sy'n addas i ddefnydd tir twristiaeth yn ogystal â*	Ddim yn derbyn. Mae'r Cyngor yn ystyried fod geiriad presennol Polisi PE12 (a'r polisïau cysylltiedig) yn cadw cydbwysedd rhwng galluogi datblygiadau twristiaeth priodol a gwarchod yr adnodd gwledig y mae ymwelwyr yn dod i'r ardal i'w fwynhau. Ystyrir fod y	Mae CNC yn fodlon ag ymateb FCC, gan y byddai unrhyw gynnig sy'n dod o dan PE12 yn ddarostyngedig hefyd i ofynion Polisi

	sydd mewn perygl o lifogydd. Id1054		*dweud y bydd datblygiad penodol 'yn cael ei ganiatáu'.* *Mae'r polisïau twristiaeth a amlinellwyd uchod yn ymwneud ag ardaloedd sy'n gorwedd yn rhannol o fewn Parth C1 a/neu Barth C2, yn ôl y DAM ac o fewn y 1%/0.5% (1 mewn 100/1 mewn 200) a/neu 0.1% (1 mewn 1000) AEP amlinelliadau llifogydd yn ôl ein Map Risg Llifogydd.* *Er mwyn goresgyn y mater hwn, byddem yn cynghori fod y Polisi yn cynnwys meini prawf penodol i lywio datblygiadau yn y dyfodol i ffwrdd o'r ardaloedd perygl llifogydd.* *Mae'n rhaid i'r polisi Cynllun Rheoli Traethlin (SMP) gael ei ystyried mewn perthynas â datblygiad parhaus llety ymwelwyr yn ardal Talacre. Dylid nodi mai polisi'r SMP o Bolisi Uned aa1 PU4.4 sy'n ymdrin â darn gorllewinol yr arfordir (y system twyni tywod) yn Nhalacre yw 'adlinio a reolir' i Gyfnodau 1 (20 ml), 2 (50 ml) a 3 (100 ml). Rydym felly yn gwrthwynebu Polisi sy'n canolbwyntio datblygiad pellach yn y lleoliad hwn."*	gwrthwynebydd wedi camddehongli Polisi PE12. Mae'r polisi yn cefnogi'n gyffredinol datblygiadau twristiaeth yn ffiniau anheddau ac yna'n mabwysiadu meini prawf ar gyfer datblygiadau twristiaeth y tu allan i ffiniau anheddau. Nid yw'r polisi'n dynodi unrhyw barsel tir penodol neu ddarnau mawr o dir ar gyfer datblygiadau twristiaeth ar y mapiau cynigion. Bydd unrhyw ardaloedd twristiaeth sy'n codi mewn ardaloedd perygl llifogydd angen cael eu hasesu yn erbyn polisi EN14 yn ogystal â PPW10 a TAN15.	EN14. Felly mae'n pryderon wedi cael eu datrys.
Perygl Llifogydd – PE13 Datblygu Carafannau yng Nghefn Gwlad Agored					
1.10	Pryder am ddynodi darnau mawr	Cytunwyd	Yn ei ymateb ar y Cynllun Adnau, dywedodd CNC:	Ddim yn derbyn. Ystyrir fod y gwrthwynebydd wedi camddehongli geiriad y polisi sy'n datgan y bydd datblygu carafannau yn cael ei eithrio'n	Mae CNC yn fodlon ag ymateb FCC, gan y byddai unrhyw gynnig

	o dir ar gyfer datblygu carafannau sydd mewn perygl o lifogydd. Id1055		"*Mae'r polisïau hyn yn dynodi darnau mawr o dir fel rhai sy'n addas i ddefnydd tir twristiaeth yn ogystal â dweud y bydd datblygiad penodol 'yn cael ei ganiatáu'.* *Mae'r polisïau twristiaeth a amlinellwyd uchod yn ymwneud ag ardaloedd sy'n gorwedd yn rhannol o fewn Parth C1 a/neu Barth C2, yn ôl y DAM ac o fewn y 1%/0.5% (1 mewn 100/1 mewn 200) a/neu 0.1% (1 mewn 1000) AEP amlinelliadau llifogydd yn ôl ein Map Risg Llifogydd.* *Er mwyn goresgyn y mater hwn, byddem yn cynghori fod y Polisi yn cynnwys meini prawf penodol i lywio datblygiadau yn y dyfodol i ffwrdd o'r ardaloedd perygl llifogydd.* *Mae'n rhaid i'r polisi Cynllun Rheoli Traethlin (SMP) gael ei ystyried mewn perthynas â datblygiad parhaus llety ymwelwyr yn ardal Talacre. Dylid nodi mai polisi'r SMP o Bolisi Uned aa1 PU4.4 sy'n ymdrin â darn gorllewinol yr arfordir (y system twyni tywod) yn Nhalacre yw 'adlinio a reolir' i Gyfnodau 1 (20 ml), 2 (50 ml) a 3 (100 ml). Rydym felly yn gwrthwynebu Polisi sy'n canolbwyntio datblygiad pellach yn y lleoliad hwn."*	benodol o ardal Talacre, Gronant a Gwesbyr. Caiff hyn ei esbonio ymhellach yn rhan olaf paragraff 10.36 ac mae'n ddull a drosglwyddwyd o'r Cynllun Datblygu Unedol. Y tu allan i'r ardal hon, mae'r polisi yn mabwysiadu dull seiliedig ar feini prawf i ystyried cynigion pellach sy'n gysylltiedig â datblygu carafannau. Os yw'r Arolygydd yn ystyried y gall y polisi gael ei eirio'n gliriach o safbwynt yr agwedd at ddatblygu yn ardaloedd Talacre, Gronant a Gwesbyr, yna ni fyddai'r Cyngor yn gwrthwynebu hyn. Mae'r Cyngor yn awgrymu y gallai rhan agoriadol meini prawf a) gael ei ail-eirio fel a ganlyn: 'Ni fydd datblygu llefydd i garafannau sefydlog yn cael ei ganiatáu yn ardal Talacre, Gronant a Gwesbyr (fel ag y'u diffinnir ar y mapiau cynigion). Fel arall yn y Sir caniateir cynigion lle: ….' Bydd unrhyw bryderon am risg llifogydd yn cael eu hasesu yn y cam gwneud cais a dim ond os yw'r cynnig yn cydymffurfio â'r polisïau perygl llifogydd perthnasol yn lleol a chenedlaethol y bydd y datblygiad yn cael ei ganiatáu. Nid oes angen meini prawf ychwanegol. Ni fydd cynigion perthnasol yn cael eu hystyried yng ngoleuni polisi PE13 ar ei ben ei hun ond yng nghyd-destun pob polisi cynllunio perthnasol arall.	sy'n dod o dan PE13 yn ddarostyngedig hefyd i ofynion Polisi EN14. Mae hyn felly yn mynd i'r afael â'n pryderon.
Perygl Llifogydd – PE14 Dyffryn Maes Glas					

1.11	Pryder am ddynodi ardaloedd mawr o dir i'w ddatblygu sydd mewn perygl o lifogydd. Id1056	Cytunwyd	Yn ei ymateb ar y Cynllun Adnau, dywedodd CNC: "*Mae'r polisïau hyn yn dynodi darnau mawr o dir fel rhai sy'n addas i ddefnydd tir twristiaeth yn ogystal â dweud y bydd datblygiad penodol 'yn cael ei ganiatau'.* *Mae'r polisïau twristiaeth a amlinellwyd uchod yn ymwneud ag ardaloedd sy'n gorwedd yn rhannol o fewn Parth C1 a/neu Barth C2, yn ôl y DAM ac o fewn y 1%/0.5% (1 mewn 100/1 mewn 200) a/neu 0.1% (1 mewn 1000) AEP amlinelliadau llifogydd yn ôl ein Map Risg Llifogydd.* *Er mwyn goresgyn y mater hwn, byddem yn cynghori fod y Polisi yn cynnwys meini prawf penodol i lywio datblygiadau yn y dyfodol i ffwrdd o'r ardaloedd perygl llifogydd.* *Mae'n rhaid i'r polisi Cynllun Rheoli Traethlin (SMP) gael ei ystyried mewn perthynas â datblygiad parhaus llety ymwelwyr yn ardal Talacre. Dylid nodi mai polisi'r SMP o Bolisi Uned aa1 PU4.4 sy'n ymdrin â darn gorllewinol yr arfordir (y system twyni tywod) yn Nhalacre yw 'adlinio a reolir' i Gyfnodau 1 (20 ml), 2 (50 ml) a 3 (100 ml). Rydym felly yn gwrthwynebu Polisi sy'n canolbwyntio datblygiad pellach yn y lleoliad hwn."*	Derbyniwyd yn rhannol. Ystyrir fod y gwrthwynebydd wedi camddehongli'r polisi. Mae'n cydnabod fod Dyffryn Maes Glas yn atyniad pwysig i ymwelwyr ond ei fod hefyd yn adnodd pwysig oherwydd ei hamdden, tirlun, cadwraeth natur a'i bwysigrwydd hanesyddol. Nid yw'r polisi yn ceisio annog neu hybu datblygiadau newydd ond yn hytrach mae'n caniatáu datblygiad newydd lle nad yw'n tynnu oddi ar ei nodweddion a'i gymeriad. Mae'r mapiau Cyngor Datblygu yn dangos mai dim ond ardaloedd bychain ar hyd ymyl Dyffryn Maes Glas sydd wedi'u lleoli o fewn Parth C1, gyda'r darn sydd wrth y gored a nesaf at Glawdd Wat wedi'i leoli yn C2. Bydd unrhyw faterion sy'n codi o berygl llifogydd yn cael ei drin ar sail safle penodol yn erbyn polisi EN4 a PPW/TAN15. Fodd bynnag, os yw'r Arolygydd yn ystyried y gellid gwella geiriad y polisi i egluro ei fod yn ceisio gwarchod rhag datblygu yn hytrach na hybu datblygu, ni fyddai gan y Cyngor unrhyw wrthwynebiad. Awgrym i ail-eirio'r polisi '**Ni ddylai** cynigion datblygu oddi mewn i Ddyffryn Maes Glas neu nesaf ato, fel y dynodwyd ar y map cynigion, dynnu oddi ar botensial twristiaeth y Dyffryn neu niweidio ardaloedd neu nodweddion tirlun, cadwraeth natur neu werth hanesyddol'.	Mae CNC yn fodlon ag ymateb FCC, gan y byddai unrhyw gynnig sy'n dod o dan PE14 yn ddarostyngedig hefyd i ofynion Polisi EN14. Mae hyn felly yn mynd i'r afael â'n pryderon.

EN13 Datblygiadau Ynni Adnewyddadwy a Charbon Isel – Crumps Yard, Cei Connah					
1.12	Mae'r dyraniad solar yn gorwedd yn rhannol o fewn perygl llifogydd C1 Id1058	Cytunwyd	Yn ei ymateb ar y Cynllun Adnau, dywedodd CNC: "*Byddai'r dyraniad a gynigir yn cynnwys fferm solar.* *Mae'r safle'n gorwedd mewn parth perygl llifogydd C1 ac felly, ystyriwn y dylai asesiad pellach o ran risg llifogydd gael ei wneud ar y safle cyn dechrau er mwyn dangos ei fod yn gynaliadwy ac yn gallu cael ei gyflawni.* *Mae'r safle yn rhannol o fewn Parth C1 fel y'i diffiniwyd gan y DAM. Mae Map Perygl Llifogydd CNC yn cadarnhau fod y safle'n gorwedd yn rhannol o fewn yr amlinelliad llifogydd 0.5% AEP. Mae Asesiad Strategol Canlyniadau Llifogydd (SFCA) eich Awdurdod hefyd yn dangos fod perygl i'r safle wrth ystyried y digwyddiad torri ym Mhentre a Queensferry, i'r AEP 0.5%, gan ganiatau am newid hinsawdd. O ystyried dynodiad C1 y safle, a natur y cynnig, byddai angen paratoi Asesiad Canlyniadau Llifogydd (FCA) i gefnogi'r cais (Adran 10 TAN15) er mwyn dangos y gellid cyflawni'r cynnig o safbwynt risg llifogydd. Yn absenoldeb FCA, rydym yn gwrthwynebu'r dynodiad hwn, nes y*	Er bod y Cyngor yn nodi sefyllfa CNC mewn perthynas â'r safle hwn, gan fod y safle bellach yn destun cais cynllunio, paratowyd FCA i gefnogi datblygu'r safle fel fferm solar a gofynnwyd am ac ystyriwyd sylwadau CNC wrth ystyried y cais. Mae'r Cyngor yn credu ei fod wedi dangos yn glir fod y safle'n addas ac yn arbennig ei fod yn gallu osgoi a lliniaru effeithiau perygl llifogydd i'r safle a'r datblygiad arfaethedig. Yn amodol ar gael caniatâd cynllunio, ni fydd angen cyflwyno'r safle hwn fel dynodiad yn y cynllun a bydd y map cynigion yn cael ei newid yn dilyn archwiliad a diweddariad am gyd-destun cynllunio'r safle. Mae'r Cyngor yn siomedig gyda safbwynt CNC a'r tensiwn yr ymddangosir sy'n bodoli gyda bwriad cadarnhaol ehangach polisi ac uchelgais Llywodraeth Cymru i hyrwyddo pob cyfle am ddatblygiadau ynni adnewyddadwy a lleihau carbon. Mae'r gwrthdaro hwn yn ei gwneud yn anodd i'r Cyngor osod cyfeiriad clir i bolisïau lleol a bydd y Cyngor yn parhau i weithio gyda CNC i geisio datrys y tensiynau hyn gyda meysydd polisi cenedlaethol a rhyngddynt. O ran diweddariad: cymeradwywyd caniatâd cynllunio i fferm solar Crumps Yard ar 23/09/20 (060765).	Yng ngoleuni'r uchod, nid oes gan CNC felly bryderon am bolisi EN13

			ceir tystiolaeth ddigonol i ddangos y gellir rheoli risg llifogydd yn unol â TAN15. *Mae'r safle'n gorwedd mewn parth perygl llifogydd C1 ac felly, ystyriwn y dylai asesiad pellach o ran risg llifogydd gael ei wneud ar y safle cyn dechrau er mwyn dangos ei fod yn gynaliadwy ac yn gallu cael ei gyflawni.* Cyflwynwyd FCA manwl i gefnogi cais 060765. Ar ôl codi sawl pryder, paratowyd FCA diwygiedig, a oedd yn dangos y gellid rheoli'r risg llifogydd i'r safle mewn ffordd dderbyniol, a olygodd ein bod wedi tynnu'n ôl ein gwrthwynebiad i'r cynnig. Yng ngoleuni'r uchod, nid oes gennym felly bryderon am bolisi EN13		
EN14 Flood Risk					
1.13	Mae IIA yn amcangyfrif yn rhy isel y perygl llifogydd i rai dyraniadau cyflogaeth a Phrif Ardaloedd Cyflogaeth Id 1049	Cytunwyd	Yn ei ymateb ar y Cynllun Adnau, gwnaeth CNC y sylwadau canlynol: "*Teimlwn fod asesiad IIA i'r cynllun yn tanbrisio'r perygl llifogydd i rai o'r dyraniadau ac nid yw'n glir sut cafodd yr IIA ei ddylanwadu gan yr Asesiad Strategol Canlyniadau Llifogydd (SFCA). I ddyraniadau o fewn/yn rhannol o fewn parthau llifogydd, mae'n bosibl a fydd cynnwys elfen o seilwaith gwyrdd yn cael effaith sylweddol ar lefelau'r*	Nodwyd. Ar hyn o bryd mae'r Cyngor yn gweithio i fynd i'r afael â phryderon CNC sy'n ymwneud a rhai Dyraniadau Cyflogaeth PE1 a rhai Prif Ddyraniadau Cyflogaeth PE2. Ail-ymwelwyd â'r Asesiad Strategol Canlyniadau Llifogydd er mwyn gwneud asesiad o'r safleoedd a wrthwynebwyd ac mae'r Cyngor yn cynnig polisi diwygiedig ac ychwanegol a newidiadau i eiriad y testun esboniadol i amlygu'r angen i osgoi risg llifogydd drwy fesurau cynllunio a dylunio a'r gofyniad am Asesiadau Canlyniadau Llifogydd manwl fel rhan o ystyriaeth ceisiadau	Yn dilyn gwaith pellach i fynd i'r afael â phryderon CNC am risg llifogydd (gweler materion sy'n gysylltiedig â PE1 a PE2), mae CNC yn fodlon fod y mater wedi'i ddatrys. Byddem yn argymell, er mwyn eglurder, fod yr Asesiad Effaith

			perygl llifogydd a brofir ar y safle. Oherwydd hynny, ni fyddem yn ystyried hyn yn lliniariad digonol i gefnogi newid y sgorio fel y'i cyflwynir yn yr IIA a byddai angen tystiolaeth bellach (gweler sylwadau perygl llifogydd isod). Nodwn ei bod yn ymddangos nad yw'r dyraniadau a wnaed yn PE2 wedi cael eu hasesu"	cynllunio dilynol. Mae'r IIA yn arfarniad lefel uchel o'r Cynllun a gellir ail-ymweld ag ef i ystyried y newidiadau a gynigir i PE1 a PE2 os oes angen.	Integredig yn cael ei ddiweddaru felly i adlewyrchu'r newidiadau a wnaed i'r CDLl.

Tabl 2 – Sylwadau CNC o dan y pennawd 'Materion o Eglurder'					
ID SoCG	Pwnc	Statws (Cytunwyd, Parhaus, Heb Gytuno)	Safbwynt CNC	Safbwynt yr Awdurdod Cynllunio Lleol	Safbwynt Terfynol / Gweithredu sydd ei Angen
STR2 Lleoliad Datblygiadau					
2.1	Gofyn i'r cyfeiriad at 'dyluniad yn gysylltiedig â graddfa a chymeriad cadarnhaol' fod yn weithredol i bob haen anheddiad. Id1059	ddim yn berthnasol	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: Mae CNC yn croesawu'r gofyniad y dylai datblygiadau tai Haenau 4 a 5 fod yn gysylltiedig â graddfa, cymeriad a rôl yr anheddiad ac yn Haen 5 'fod angen i ddatblygiadau fod wedi'u synio a'u dylunio'n sensitif...i barchu cymeriad ac ymddangosiad y safle a'i amgylchedd'. Rydym yn argymell y dylai dyluniad sy'n gysylltiedig â graddfa a chymeriad cadarnhaol fod yn weithredol i bob Haen ddatblygu. Rydym yn argymell y dylai dyluniad sy'n gysylltiedig â graddfa a chymeriad cadarnhaol fod yn weithredol i bob Haen ddatblygu. Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau, nid ydym yn ystyried fod y	Ddim yn Derbyn. Mae Polisi STR2 yn datgan y bydd twf cynlluniedig, drwy ddyraniadau, yn digwydd yn nhair haen uchaf yr hierarchaeth anheddau. Mae'r rhain yn tueddu i fod yr aneddiadau mwyaf cynaliadwy o ran eu lleoliad, maint, cymeriad, rôl a lefel y cyfleusterau a'r gwasanaethau. Yn Haen 4 Aneddiadau Diffiniedig, rhoddwyd rhywfaint o ganllawiau ychwanegol i lywio math a graddfa'r datblygiad tai er mwyn sicrhau ei fod yn cyd-fynd â graddfa, cymeriad a rôl yr anheddiad. Yn Haen 5 Aneddiadau nas Diffiniwyd, nid oes ffin anheddiad ac mae'r polisi felly yn rhoi canllawiau ychwanegol sy'n dweud y dylai datblygiadau newydd fod yn sensitif ac ar raddfa fechan. Dylai'r canllawiau ychwanegol hyn weithio law yn llaw â'r gofyniad polisi fod tai newydd yn cyflawni tai fforddiadwy i anghenion lleol. Nid ystyrir fod canllawiau ychwanegol o'r fath yn briodol na'n angenrheidiol i 3 haen uchaf yr hierarchaeth anheddau. Rhaid pwysleisio hefyd fod angen darlun y Cynllun yn ei gyfanrwydd lle byddai'n	CNC yn dweud nad oes angen cytundeb. Sylw fel Mater o Eglurder yn unig oedd hwn.

			mater hwn yn ymwneud â chadernid y cynllun.	rhaid i bob cynnig datblygu fodloni polisïau PC2, 3 a 4.	
STR3A Safleoedd Strategol Porth y Gogledd					
2.2	Cyfeirio at berygl llifogydd ym Mhorth y Gogledd a chwilio am gyfeiriad at ddatblygu rhwydwaith seilwaith gwyrdd Id1050	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: Yn ei ymateb i'r Cynllun Adnau, gwnaeth CNC y sylwadau canlynol: "*Byddwch yn gwybod fod hanes cynllunio hir a chymhleth yn effeithio ar ailddatblygu'r safle hwn, a bod nifer o geisiadau cynllunio amlinellol, sy'n caniatáu datblygiadau defnydd cymysg, wedi cael eu cymeradwyo gan eich Awdurdod ers 2013. Mae angen cyfres gymhleth o fesurau lliniaru risg llifogydd ar draws y safle i reoli canlyniadau llifogydd ar y datblygiad, a'i ddefnyddwyr, yn unol â TAN15. Manylir ar y rhain yn y gwahanol adroddiadau Asesiad Canlyniadau Llifogydd (FCA) a oedd yn cefnogi'r ceisiadau cynllunio amlinellol. Gosodwyd nifer o amodau cynllunio ar y cymeradwyaethau cynllunio i sicrhau fod y mesurau allweddol i liniaru risg llifogydd yn cael eu gweithredu a'u cyflwyno dros gyfnod graddol y cytunwyd arno. Mae gwaith i ddatblygu'r safle wedi dechrau'n barod.* *Nodwn o'ch Asesiad Strategol Canlyniadau Llifogydd (SFCA) ac yn benodol atodiad B (Asesiad Safle Datblygu FCC) fod y safle wedi'i restru ar gyfer datblygiad defnydd cymysg. Mae Asesiad Datblygu'r Safle yn*	Ddim yn Derbyn. O ran dyraniad Porth y Gogledd, dyrannwyd y safle yn y CDU mabwysiedig. Mae'r safle'n manteisio ar ganiatadau cynllunio amlinellol, caniatâd o ran cyflawni amodau a chymeradwyo materion a gedwir yn ôl. Mae tai yn cael eu hadeiladu ar y safle erbyn hyn. Mae Llywodraeth Cymru wedi buddsoddi mewn gwaith amddiffyn rhag llifogydd sy'n golygu cryfhau'r argloddiau ar hyd Afon Dyfrdwy. Roedd CNC yn ymgynghorai statudol drwy gydol y prosesau dyrannu safle a chais cynllunio a rhoddwyd cynllun rheoli llifogydd addas yn ei le. Fel y cadarnhawyd yn ein hymateb i'r Cynllun Adnau, nid ydym yn ystyried fod y mater hwn yn gysylltiedig â chadernid y cynllun.	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn unig oedd y sylw hwn.

			datgan y byddai rhagdybiaeth yn erbyn datblygiad o berygl mawr ar y safle hwn, ac y dylai'ch Awdurdod ystyried tynnu'r datblygiad perygl uchel o'r cynllun. O ystyried fod bwriad dyrannu'r safle, byddai naratif pellach i gefnogi hyfywedd yng nghyfnod y cynllun yn fuddiol. *STR3A a 3B – byddem yn argymell cyfeirio at rwydwaith seilwaith Gwyrdd a thirweddu strategol a rhwydwaith GI. Awgrymwn gynnwys y rhwydweithiau hyn yn yr SPG a gynigir ar y Seilwaith Gwyrdd".* I fod yn fwy eglur, mae Atodiad B o'r SFCA yn dod i'r casgliad nad yw datblygiad perygl uchel yn briodol yn y safle hwn, oherwydd bod y safle wedi'i leoli'n rhannol ym Mharth C2. Mae'r safle wedi'i leoli ym Mharth C1, felly mae'r casgliad hwn yn anghywir. Ar ben hynny, fel y gwyddoch, mae'r safle'n elwa ar nifer o ganiatadau cynllunio ac mae adeiladu wedi dechrau arno, yn cynnwys rhai o'r tai. Gwnaed asesiad trwyadl o berygl llifogydd i gefnogi'r caniatadau cynllunio amlinellol, a oedd yn cynnwys FCAs manwl wedi'u hategu gan astudiaethau model hydrolig. Yn seiliedig ar y gwaith hwn, cynigiwyd cyfres o fesurau lliniaru, a oedd yn dangos y gallai'r perygl llifogydd i'r datblygiad defnydd cymysg a oedd yn cael ei gynnig ar y safle, gael ei reoli mewn ffordd dderbyniol. Felly, mae'r casgliad yn yr SFCA nad yw tai yn		

			ddefnydd priodol o'r tir ar y safle yn anghywir hefyd. Er eglurder, awgrymwn fod yr SFCA a'r Atodiad B cysylltiedig (sy'n dod i'r casgliad nad yw datblygiad perygl mawr yn ddefnydd priodol o'r tir ar y safle hwn) yn cael eu diweddaru i adlewyrchu'r uchod. Fel y cadarnhawyd yn ein hymateb i'r Cynllun Adnau, nid ydym yn ystyried fod y mater hwn yn gysylltiedig â chadernid y cynllun.		
STR3B Safleoedd Strategol Warren Hall					
2.3	Cyfeirio at yr angen am rwydwaith seilwaith gwyrdd a thirlunio strategol Id1272	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: '*byddem yn argymell cyfeirio at rwydwaith seilwaith Gwyrdd a thirweddu strategol a rhwydwaith GI. Awgrymwn gynnwys y rhwydweithiau hyn yn SPG a gynigir ar y Seilwaith Gwyrdd* . Fel y cadarnhawyd yn ein hymateb i'r Cynllun Adnau, nid ydym yn ystyried fod y mater hwn yn gysylltiedig â chadernid y cynllun.	Ddim yn Derbyn. O ran STR3A a B, cyfeirir fel rhan o eiriad y polisi ar bob safle at 'seilwaith gwyrdd'. Nid ystyrir fod angen cyfeiriad pellach.	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn unig oedd y sylw hwn.
STR4 Egwyddorion Datblygu Cynaliadwy, Dylunio a Chreu Lleoedd					
2.4	Yn gofyn am gyfeiriad at natur aml-swyddogaeth y rhwydwaith gwyrdd a	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad:	Ddim yn Derbyn. Mae STR4 yn bolisi strategol sy'n gosod allan y gofynion ar gyfer egwyddorion dylunio creu lleoedd cynaliadwy ac yn tynnu sylw at y materion drwy set o 10 maen prawf. Mae Polisi STR13 Amgylcheddau Naturiol ac Adeiledig, Rhwydweithiau a	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn unig oedd y sylw hwn.

	chyfeirio at gymeriad unigryw lleol Id1061		'*STR4: Egwyddorion Datblygu Cynaliadwy a Chreu Lleoedd - rydym yn croesawu cynigion i ii) ymateb i gyd-destun a chymeriad lleol, parchu a gwella'r amgylchedd naturiol, adeiledig a hanesyddol a bod yn briodol o ran graddfa, dwysedd, cymysgedd a chynllun; v) cyfrannu at les cymunedau, yn cynnwys diogelu amwynderau, tir y cyhoedd, darparu mannau agored a hamdden, tirlunio a darparu parcio mewn cyd-destunau preswyl; vi) ymgorffori'r newydd a chysylltu â'r Seilwaith Gwyrdd sy'n bodoli'n barod, hybu bioamrywiaeth. Fodd bynnag, byddem yn awgrymu fod natur aml-swyddogaeth GI yn cael ei gydnabod a bod pwysigrwydd cymeriad y tirwedd a'r cymeriad unigryw lleol, sy'n wir am bob cynnig, yn cael eu cynnwys.* *5.31 - yn cyfeirio at aneddiadau hanesyddol a thirwedd gwledig gydag amgylchedd adeiledig o ansawdd uchel ac at asedau treftadaeth yn cynnwys parciau, gerddi a thirluniau hanesyddol ac y dylai dyluniad adlewyrchu hyn a rhoi sylw i gymeriad lleol a chyd-destun y safle. Rydym yn cynghori y dylid cynnwys cyfeiriad at gymeriad y tirlun yma er mwyn sicrhau fod pob agwedd o arwahanrwydd lleol yn cael sylw'.* Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau Lleol, nid ydym yn ystyried fod y mater hwn yn gysylltiedig â chadernid y cynllun.	Seilwaith Gwyrdd yn darparu canllawiau strategol ar fater seilwaith gwyrdd, yn ogystal â'r amgylchedd naturiol ac adeiledig/hanesyddol. Caiff materion rhwydwaith gwyrdd a thirwedd eu cynnwys yn fanylach yn y polisïau ar gymeriad y tirwedd ac arwahanrwydd lleol eu gweld ym mholisïau EN2 Rhwydwaith Gwyrdd ac EN4 Cymeriad y tirwedd. Ym mharagraff 5.3.1 mae'r rhestr o asedau hanesyddol yn cynnwys tirweddau felly bydd yn rhaid i unrhyw ddatblygiad gynnwys cymeriad y tirwedd. Dylid darllen y cynllun yn ei gyfanrwydd.	
STR5 Trafnidiaeth a Hygyrchedd					
2.5	Gofyn am gyfieirad at rwydweithiau	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw	Ddim yn Derbyn. Cyfeirir yn barod ym Mholisi STR5 at rwydweithiau Seilwaith Gwyrdd. Mae pwynt bwled (vi) yn datgan 'Darparu llwybrau	CNC yn dweud nad oes angen cytundeb. Mater

	seilwaith gwyrdd Id1063		canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: *'rydym yn cynghori cynnwys cyfeiriad at rwydweithiau Seilwaith Gwyrdd yma, a all gynnwys llwybrau cerdded a seiclo a gwella profiad cerdded a seiclo yn sylweddol*. *5.39 – rydym yn argymell cysylltu cynigion Teithio Llesol â'r Canllawiau Cynllunio Atodol ar y Strategaeth Seilwaith Gwyrdd.* *6.5 - o safbwynt datblygiadau twristiaeth a chyfleoedd sy'n codi o'r AHNE a thirlun gwledig deniadol Sir y Fflint, byddem yn awgrymu cyfeirio at Awyr Dywyll'*. Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau Lleol, nid ydym yn ystyried fod y mater hwn yn gysylltiedig â chadernid y cynllun.	cerdded a seiclo, a chysylltu hynny â rhwydweithiau teithio llesol'. Nid oes angen mwy o eiriau yn y maen prawf. Cyfeiriad eisoes wedi'i gynnwys yn y Cynllun, yn yr esboniad ar Bolisi EN2 (Paragraff 12.10) fel a ganlyn: 'Dylai seilwaith gwyrdd fod wedi'i gynllunio fel ei fod yn integreiddio â'r hawliau tramwy sy'n bodoli'n barod a llwybrau cerdded a seiclo (yn cynnwys Llwybrau Teithio Llesol) yn ogystal ag asedau eraill o ran cadwraeth natur a mannau gwyrdd a adnabuwyd. Bydd y Polisi hwn yn cael ei ategu gan Ganllawiau Cynllunio Atodol ar Seilwaith Gwyrdd'. Mae paragraff 6.5 yn rhan o gyflwyniad cyffredinol sy'n arwain i mewn i bolisïau Economi'r Cynllun ac nid ystyrir fod angen cyfeirio at Awyr Dywyll. Mae gan y Cynllun bolisi manwl (EN5) i'r AHNE ac mae polisi EN18 yn mynd i'r afael â llygredd golau yng ngeiriad y polisi gyda chyfeiriad at y cynllun Awyr Dywyll yn y geiriau o esboniad. Mae angen darllen y Cynllun yn ei gyfanrwydd.	o Eglurder yn unig oedd y sylw hwn.
STR10 Twristiaeth, Diwylliant a Hamdden					
2.6	Yn gofyn am gyfeiriad at reolaeth sensitif Id1065	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: *'o safbwynt hyrwyddo hygyrchedd i dirlun Sir y Fflint rydym yn cynghori cydnabod fod yn rhaid gwneud hyn ochr yn ochr â rheolaeth sensitif (nodwyd yn 6.28 ond gallai fod yn STR10)'*	Nodwyd. Mae'r Cyngor yn cydnabod y sylw. Fodd bynnag, gan fod angen darllen y Cynllun yn ei gyfanrwydd gyda pholisïau yn cysylltu â'i gilydd, mae'r Cyngor yn anghytuno â'r sylw hwn ac yn credu fod geiriad presennol Polisi STR10 (a'r polisïau cysylltiedig) yn ddigonol. Nodir yr wybodaeth ychwanegol a gynigir yn 6.28 ac o fewn rhan (iv) sy'n darllen: *'Cadw a chyfoethogi treftadaeth naturiol, adeiledig a diwylliannol Sir y; Fflint;'*	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn unig oedd y sylw hwn.

			Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau Lleol, nid ydym yn ystyried fod y mater hwn yn gysylltiedig â chadernid y cynllun.		
STR13 Yr Amgylchedd Naturiol ac Adeiledig, Seilwaith Gwyrdd ac Isadeiledd					
2.7	Yn gofyn am gyfeiriad at geoamrywiaeth Id1066	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: *'Byddai CNC yn croesawu cyfeiriad yn yr adran hon at Geoamrywiaeth'.* Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau, nid ystyriwn fod y mater hwn yn gysylltiedig â chadernid y cynllun.	Ddim yn Derbyn. Mae maen prawf ii yn datgan "Cadw, diogelu a chyfoethogi ansawdd ac amrywiaeth amgylchedd naturiol Sir y Fflint yn cynnwys .... Mae defnyddio'r gair 'yn cynnwys' yn golygu nad yw'r rhestr yn derfynol ac felly gall y polisi ymwneud â geoamrywiaeth. Sonnir am geoamrywiaeth hefyd ym mharagraff esboniadol 8.10. Nid ystyrir fod angen newid y polisi.	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn unig oedd y sylw hwn.
STR14 Newid Hinsawdd a Gwarchod yr Amgylchedd					
2.8	Cefnogi d1067	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: *'rydym yn croesawu cyfeiriad (vi) at warchod yr amgylchedd rhag llygredd golau'.* Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau, nid ystyriwn fod y mater hwn yn gysylltiedig â chadernid y cynllun.	Nodwyd	dd/b
PC2 Gofynion Datblygu Cyffredinol					
2.9	Yn gofyn am gyfeiriad at y seilwaith gwyrdd	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad:	Ddim yn Derbyn. Dylid darllen y cynllun yn ei gyfanrwydd. Mae polisïau EN2, STR4, STR6 a STR13 i gyd yn cyfeirio at ddarparu neu ddiogelu'r Seilwaith Gwyrdd. Nid oes angen ei gynnwys yn PC2.	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn

	Id1068		*'a) rydym yn argymell cynnwys y dylai datblygiadau gyfrannau ar y Seilwaith Gwyrdd'*. Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau, nid ystyriwn fod y mater hwn yn gysylltiedig â chadernid y cynllun.		unig oedd y sylw hwn.
PC3 Dyluniad					
2.10	Yn gofyn am gyfeirio at liw a golau ym maen prawf a) ac yn gofyn am newidiadau i e) o ran canllawiau dylunio a chyfeirio at geoamrywiaeth. Id1070	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: *'a) rydym yn argymell cynnwys y defnydd o liw a'r defnydd o olau yma ac e) yn cyfeirio at ofod amwynder, tirlunio a phlannu – dylai hyn i gyd gael ei gynnwys fel rhan o gynllun tirlunio cynhwysfawr. Aneglur at beth mae 'tirlunio' yn cyfeirio. Cyfeirir at yr SPG Gofod o Amgylch Anheddau. Rydym yn argymell SPG canllawiau dylunio cynhwysfawr yn cynnwys gofodau, adeiladau, graddfa, ffurf, defnyddiau, lliw, golau fel canllaw holistig i adeiladau a thirweddau.* *Byddai CNC yn croesawu cyfeiriad yn yr adran hon at gynnwys cyfleoedd i gyfoethogi a dehongli geoamrywaieth wrth ddylunio cynlluniau.'* Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau, nid ystyriwn fod y mater hwn yn gysylltiedig â chadernid y cynllun.	Ddim yn Derbyn. Nid ysgytir fod angen i faen prawf a) gyfeirio at olau pan mae golau'n cael ei grybwyll yn benodol ym maen prawf e). Mae maen prawf a) yn cyfeirio at 'ddyluniad' a 'defnyddiau' ac mae'r termau hyn yn gallu ystyried 'lliw' a materion eraill fel 'gwead' heb gyfeirio at hynny'n benodol yn y polisi. Ceisiodd y polisi gynnwys y termau allweddol. Ym maen prawf e) cyfeirir at dirlunio ac mae ansicrwydd am hyn. Diffiniad y geiriadur o 'dirlunio' yw 'y broses o wneud gardd neu ddarn arall o dir yn fwy deniadol drwy newid y dyluniad sydd yno'n barod, ychwanegu nodweddion addurniadol, a phlannu coed a llwyni'. Fel rhan o edrych ar ddyluniad datblygiad mae'n arfer da ystyried y rôl sydd gan dirlunio yn y cynllun. Mae gan y Cyngor gyfres o SPGs mabwysiedig ac mae atodiad 2 y datganiad ysgrifenedig yn nodi'r SPGs y mae'r Cyngor yn bwriadu eu hadolygu a'u mabwysiadu. O ystyried y canllaw dylunio yn TA12 Dylunio a'r pwyslais cynyddol ar Greu Lleoedd yn PPW10 nid oes angen canllaw dylunio cynhwysfawr i'r Sir. Mae angen darllen y Cynllun yn ei gyfanrwydd ac mae'r gwrthwynebydd wedi anfon gwrthwynebiad ar wahân i bolisi EN6 yn gofyn am gyfeiriad at geoamrywaieth.	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn unig oedd y sylw hwn.

PC4 Cynaliadwyedd a Gwydnwch Datblygiadau Newydd					
2.11	Yn gofyn am gyfeiriad at Reoli Adnoddau Naturiol yn Gynaliadwy (SMNR). Id1071	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: *'c) rydym yn croesawu cynnwys 'ymgorffori nodweddion plannu, tirlunio a dyluniad sy'n lliniaru effeithiau newid hinsawdd' ond yn cynghori y dylai'r elfennau hyn i gyd fod yn rhan o gynllunio tirlunio cynhwysfawr ac yn argymell fod cyfeiriad yn cael ei wneud at Reoli Adnoddau Naturiol yn Gynaliadwy (SMNR). Yn yr un modd, dylai 9.11 a 9.13 gyfeirio at SMNR a chynllun tirlunio integredig, cynhwysfawr i'r datblygiad'*. Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau, nid ystyriwn fod y mater hwn yn gysylltiedig â chadernid y cynllun.	Derbyn yn rhannol. Nod y polisi yw sicrhau fod prif egwyddorion datblygu cynaliadwy yn cael eu hystyried a'u hymgorffori yn gynnar yn y broses ddylunio. Croesewir cefnogaeth i c) y polisi. Cyfeirir at 'Rheoli Adnoddau Naturiol yn Gynaliadwy' yn amlwg yn PPW10 ac nid yw'n glir pam fod angen ailadrodd hwn yn yr esboniad i'r polisi. Fodd bynnag, os yw'r Arolygydd yn ystyried y byddai cyfeirio at yr SMNR yn gwella deall a gweithredu'r polisi, yna ni fyddai'r Cyngor yn gwrthwynebu hyn. Mae'r Cyngor yn awgrymu'r gwelliannau canlynol i'r Cynllun: Awgrym geiriad, Ychwanegu at faen prawf c) – "mae'n ymgorffori nodweddion plannu, tirlunio a dylunio o fewn dull Rheoli Adnoddau Naturiol yn Gynaliadwy (SMNR) sy'n lliniaru effeithiau newid hinsawdd megis mwy o lawiad trwm a thymereddau uchel; '' Ychwanegu at 4edd brawddeg paragraff 9.11 "Byddai disgwyl i ddatblygiadau ddefnyddio'r Datganiadau Dylunio a Mynediad (DAS) ac o fewn y rheiny dull Rheoli Adnoddau Naturiol yn Gynaliadwy (SMNR) gyda cheisiadau perthnasol, i ddangos sut mae'r cynigion yn cyflawni bwriadau'r polisi hwn drwy egluro sut mae dyluniad y cynnig yn ymateb i gynaliadwyedd amgylcheddol." Ychwanegu at ddiwedd paragraff 9.13 Dylai dull Rheoli Adnoddau Naturiol yn Gynaliadwy gynnwys hefyd gosod allan cynllun tirlunio integredig cynhwysfawr ar gyfer y datblygiad.	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn unig oedd y sylw hwn.

PC5 Trafnidiaeth a Hygyrchedd					
2.12	Yn gofyn am gyfeiriad at seilwaith gwyrdd. Id1072	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: *'cynghorwn y dylai'r polisïau hyn gyfeirio at y Seilwaith Gwyrdd a phwysigrwydd cerdded a seiclo ar hyd llwybrau gwyrdd'.* Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau, nid ystyriwn fod y mater hwn yn gysylltiedig â chadernid y cynllun.	Ddim yn Derbyn. Mae angen darllen y Cynllun yn ei gyfanrwydd a cheir cyngor ynghylch y seilwaith gwyrdd yn EN2.	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn unig oedd y sylw hwn.
PC10 Cynlluniau Trafnidiaeth Newydd					
2.13	Yn gofyn am gyfeiriad at dirlunio ac ystyriaethau amgylcheddol eraill Id1074	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: *'cynghorwn y dylai'r polisi hwn gyfeirio at dirlunio ac ystyriaethau amgylcheddol eraill, lliniaru a chyfoethogi posibl. Mae PC11, Dociau Mostyn, mewn cyferbyniad, yn cyfeirio at effeithiau amgylcheddol mewn perthynas ag Aber afon Dyfrdwy.* Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau, nid ystyriwn fod y mater hwn yn gysylltiedig â chadernid y cynllun.	Ddim yn Derbyn. Mae angen darllen y Cynllun yn ei gyfanrwydd ac mae cyngor ynghylch tirlunio ac ystyriaethau amgylcheddol eraill mewn polisïau eraill yn y Cynllun, ee PC3, PC4, EN4 ac EN7. Mae'r cyfeiriad penodol at ystyriaethau amgylcheddol yn PC11 yn adlewyrchu lleoliad y safle yn Aber afon Dyfrdwy sy'n safle Morol Ewropeaidd yn cynnwys nifer o ddynodiadau yn cynnwys SoDdGA, safle Ramsar ac Ardal Cadwraeth Arbennig.	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn unig oedd y sylw hwn.
PE2 Prif Ardaloedd Cyflogaeth					
2.14	Yn gofyn am gyfeiriad at fesurau dylunio o safbwynt y tair Prif Ardal	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad:	Ddim yn Derbyn. Mae'r tair Prif Ardal Cyflogaeth (PAC) y cyfeirir atynt (Ystad Ddiwydiannol Broncoed, Parc Busnes yr Wyddgrug ac Ystad Ddiwydiannol yr Wyddgrug) yn gorwedd fwy na 1.5mk i ffwrdd o	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn

	Cyflogaeth yn yr Wyddgrug. Id1075		*'PE2.17, PE2.18, PE2.19 - Byddem yn croesawu cynnwys yn y polisi eiriad/cyfiawnhad wedi'i resymu i dynnu'r canlynol at sylw datblygwyr yn y dyfodol e.e.:* *I safleoedd mawr sy'n gorwedd o fewn gosodiad gweledol yr AHNE/yn wynebu cefn gwlad agored, sylw i blannu ar ffiniau; a bydd defnyddio lliwiau gwannach a gorffeniadau heb fod yn adlewyrchol ar doeau a gweddau adeiladau; a defnydd cyfyngedig o olau (wedi'u dylunio o safonau awyr dywyll) yn ystyriaethau cynllunio pwysig. O ran cefnogi datblygiadau creu llefydd, gall fod angen Asesiad Lliw Amgylcheddol er mwyn datblygu palet lliw yn ychwanegol at ddyluniad adeilad sy'n adlewyrchu'r hyn sy'n nodweddiadol yn lleol.'* Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau, nid ystyriwn fod y mater hwn yn gysylltiedig â chadernid y cynllun.	ddynodiad yr AHNE. Maent yn eistedd o fewn y ffin ffisegol a ddiffiniwyd yn glir sy'n cael ei ffurfio gan ffordd osgoi'r A494(T) ac maent yn rhan annatod o dref yr Wyddgrug. Mae'r Cynllun yn cynnwys polisïau PC2 a PC3 sy'n cynnig canllawiau dylunio ac mae polisi EN5 yn gwarchod lleoliad yr AHNE. Ymhellach, ceir canllawiau ar lygredd golau ym mholisi EN18. Nid ystyrir ei bod yn angenrheidiol nac yn briodol i ganllawiau mor fanwl fod ynghlwm wrth y polisi PAC i PACau penodol gan y gallai hyn osod cynsail i hyn gael ei ofyn amdano ar PACau penodol eraill. Mae fframwaith polisi'r Cynllun yn galluogi mynd i'r afael â phryderon CNC fel rhan o ystyried cynigion datblygu yn ôl eu rhinweddau eu hunain. Nid ystyrir y dylai'r polisi gael ei newid.	unig oedd y sylw hwn.
PE4 Arallgyfeirio ar Ffermydd					
2.15	Yn gofyn am gyfeiriad at gymeriad a llonyddwch y tirwedd Id1076	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: *'cynghorwn na ddylai unrhyw ddatblygiad fod yn niweidiol i gymeriad a llonyddwch y tirlun*. Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau, nid ystyriwn fod y mater hwn yn gysylltiedig â chadernid y cynllun.	Mae'r Cyngor yn nodi'r sylw, ond mae'r Cyngor yn anghytuno â'r sylw hwn ac yn credu fod geiriad presennol Polisi PE4 (a pholisïau cysylltiedig fel PC2 a PC3) yn taro'r cydbwysedd cywir o ran galluogi datblygiadau addas mewn lleoliadau gwledig. Mae angen darllen y Cynllun yn ei gyfanrwydd ac nid yw'n angenrheidiol fod y meini prawf yn cael eu hailadrodd yn ddiangen drwy bolisïau niferus. Mae'r polisi a gynigir ar arallgyfeirio ar ffermydd yn cynnwys y geiriau na all unrhyw gynnig newydd gael effaith niweidiol ar yr ardal o'i gwmpas, a thrwy hynny'n cyfleu cymeriad a llonyddwch lleoliad.	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn unig oedd y sylw hwn.

EN5 Ardal o Harddwch Naturiol Eithriadol					
2.16	Yn gofyn am gyfeiriad at 'leoliad' Id1077	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: *'Byddem yn argymell mân welliant i eiriad y polisi hwn er mwyn sicrhau fod digon o bwysau'n cael eu rhoi ar 'lleoliad' yn y dyfodol:* *o ran AHNE Bryniau Clwyd a Dyffryn Dyfrdwy, bydd datblygiad ond yn cael ei ganiatáu lle mae'n cadw neu'n cyfoethogi harddwch naturiol yr ardal ddynodedig a'i lleoliad. Wrth asesu effaith debygol cynigion datblygu ar harddwch naturiol yr AHNE, bydd yr effaith gronnol yn cael ei hystyried hefyd'.* Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau, nid ystyriwn fod y mater hwn yn gysylltiedig â chadernid y cynllun.	Bwriad y polisi yw ystyried cynigion oddi mewn i'r AHNE ac yn agos ato, gan y sylweddolir y gallai'r ddau niweidio'r AHNE. Fodd bynnag, derbynnir fod rhan agoriadol y polisi fel y'i hysgrifennwyd yn darllen fel pe bai'n weithredol i'r AHNE ei hun yn unig. Felly, os yw'r Arolygydd yn ystyried y byddai'r newid a gynigir yn gwella eglurder a geiriad y polisi, yna byddai'r Cyngor yn derbyn ychwanegu 'a'i lleoliad ar ôl AHNE yn llinell gyntaf geiriad y polisi.	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn unig oedd y sylw hwn.
EN6 Safleoedd o Bwysigrwydd Bioamrywiaeth					
2.17	Yn gofyn am gyfeiriad at geoamrywiaeth yn y polisi Id1078	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: *'Croesawn y cyfeiriad at geoamrywiaeth yn y testun. Byddem yn falch pe bai EN6 yn cyfeirio'n fwy penodol at geoamrywiaeth e.e. EN6: Safleoedd o bwysigrwydd Bioamrywiaeth a Geoamrywiaeth'* Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau, nid ystyriwn fod y mater hwn yn gysylltiedig â chadernid y cynllun.	Derbyn yn rhannol. Cyfeirir yng ngeiriad y polisi at ddiddordeb daearegol a phwysigrwydd daearegol. Yn eglurhad y polisi, mae Safleoedd Daearegol a Geomorffaidd Pwysig Rhanbarthol (RIGs) wedi'i gynnwys hefyd. Fodd bynnag, os yw'r Arolygydd yn ystyried y dylid ychwanegu Geoamrywiaeth at eiriad y polisi, yna ni fyddai'r Cyngor yn gwrthwynebu'r newid hwn. Newid teitl y polisi i ddarllen - ''EN6: Safleoedd o Bwysigrwydd Bioamrywiaeth a Geoamrywaieth''	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn unig oedd y sylw hwn.

EN13 Datblygiadau Ynni Adnewyddadwy a Charbon Isel					
2.18	Pryderon nad yw meini prawf i a ii o ran cynigion gwynt yn cyfeirio at y tirwedd. Argymell asesiad tirlun o Ardaloedd Chwilio Solar Id1079	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad: *'Mae'r testun yn nodi nad oes unrhyw SSAs neu ILSAs ar gyfer gwynt wedi'u hadnabod yn y sir. Mae profion y polisi yn cyfeirio at bob ynni adnewyddadwy ond dim ond 2 brawf sydd yn yr adran ganlynol ar ynni gwynt ac nid ydynt yn cynnwys effeithiau ar y tirwedd. Mae gofyn am LVIA i ddatblygiadau gwynt a solar ar raddfa fawr a gall fod angen Arfarniad Tirwedd ar gynlluniau ar raddfa fach hyd yn oed. Mae'n bosibl y bydd angen adolygu'r polisi yng ngoleuni'r NDF Drafft. Dylid cyfeirio hefyd at y posibilrwydd o effeithiau gan ddatblygiadau gwynt ar y môr a'r angen am asesiad o'r Morlun.* *Croesawn fwriad polisi clir EN13 Ardaloedd Chwilio Lleol Dangosol Ynni Adnewyddadwy (ILSA), sy'n gofyn am ddiogelu lleoliad yr AHNE rhag cynigion datblygu ynni adnewyddadwy unigol a chronnol. Nodwn fodd bynnag, o Bapur Cefndir 13 Ynni Adnewyddadwy Medi 2019, fod materion tirwedd a gweledol yr 18 ILSA yn dal heb gael eu hadolygu, er mwyn penderfynu pa safleoedd yn unigol, neu mewn cyfuniad y gellid eu cyflwyno yn hyfyw, heb effeithiau sylweddol ar leoliad yr AHNE.*	Er bod y Cyngor yn nodi'r pwyntiau a wnaed gan CNC, mae'r gwrthwynebydd wedi camddehongli diben a bwriad polisi EN13 sydd mewn perthynas â'r pwynt penodol a wnaed am ynni gwynt nid yn unig yn cynnwys 2 brawf priodoldeb ond hefyd yn gosod allan dau brawf ychwanegol ar gyfer ystyried ynni gwynt, yn ogystal â meini prawf i-viii sy'n ymwneud â PHOB cynnig ynni adnewyddadwy neu garbon isel sydd o ran diffiniad yn cynnwys y rheiny ar gyfer ynni gwynt. Mae'r meini prawf hyn yn cynnwys yn amlwg effeithiau ar y tirwedd. Wrth ddarllen y ddau faen prawf ychwanegol, maent yn glir ac yn benodol yn gysylltiedig â'r effeithiau ychwanegol sy'n deillio o ddatblygiadau ynni gwynt. O ran y cyfeiriad penodol at y AHNE, tra bod yr ILSAs yn cael asesiad pellach o'r effaith ar yr amgylchedd nid yw hyn ar gyfer taclo unrhyw effeithiau ar yr AHNE yn unig, oherwydd yn amlwg nid yw pob un yn ddigon agos i gael effaith fel yr awgrymir. Yn wir defnyddiwyd yr AHNE a pharth rhagod sylweddol y tu hwnt, fel cyfyngiad allweddol yn yr ymarfer mapio gogr a hyrwyddwyd gan Lywodraeth Cymru, i sgrinio allan tir a oedd yn debygol o gael effaith ar y lleoliad. Mae o gymorth fod y Pwyllgor AHNE wedi rhoi sylwadau cadarnhaol i gadarnhau hyn fel a ganlyn: "Mae'r bwriad i beidio ag adnabod unrhyw ILDA ar gyfer datblygiadau tyrbinau gwynt graddfa fawr i'w groesawu. Ni ddangosir ILSAs PV solar ar raddfa fawr yn yr	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn unig oedd y sylw hwn.

			*Pe bai'r Awdurdod Cynllunio Lleol yn dymuno cael mwy o sicrwydd am hyfywedd ei ILSAs arfaethedig, rydym yn argymell defnyddio dadansoddiad cynllunio tirwedd a gweledol gan ymarferwr proffesiynol yn defnyddio'r GLVIA, wedi'i ategu gan asesiad llewyrch a disgleirdeb (*glint and glare) *yn achos datblygiadau solar.* *Ystyriaethau y byddem yn disgwyl eu gweld yn cael eu hasesu:* *• Effeithiau llewyrch a disgleirdeb ar olygfeydd o'r AHNE - yn benodol o brif gopaon a lleoliadau llwybr cenedlaethol Clawdd Offa ar hyd Bryniau Clwyd. Golygfannau i'w pennu gan yr ymgynghorydd tirwedd ochr yn ochr â CNC a swyddog cynllunio'r AHNE.* *• Effaith bosibl yr ILSAs yn ymddangos fel ardaloedd mawr o fewnlenwi datblygiad, uno anheddau a threfoli o gwmpas Bwcle – yn arbennig o Foel Findeg, ond hefyd ardaloedd eraill a allai orwedd oddi mewn i barth gwelededd damcaniaethol.* *Gweler Atodiad 2 am wybodaeth ar: Penyffordd a Phenymynydd a Castle Park'.* Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau, nid ystyriwn fod y mater hwn yn gysylltiedig â chadernid y cynllun.	AHNE, ac ni fydd y rhan fwyaf o'r rheiny y tu allan i'r tirwedd gwarchodedig yn cael effaith niweidiol ar leoliad yr AHNE". Yn wir, cododd y pwyllgor bryderon gydag un ILSA yn unig, sef Mynydd yr Hob, gan argymell y dylai datblygiad ar y llethrau uchaf gael ei atal. Dyma union bwrpas yr asesiad o'r tirwedd sy'n mynd rhagddo a fydd yn mireinio'r potensial i ddatblygu o fewn yr ardaloedd chwilio drwy gyfeirio at y dopograffeg fel mater ymhlith ffactorau eraill. Yn amlwg, o ystyried natur ddangosol yr ILSA, byddai unrhyw gynigion a fyddai'n cael eu cyflwyno ar gyfer datblygu, hefyd yn gorfod bod yn destun y lefel arferol o graffu sy'n ofynnol yn y cam rheoli datblygiad, yn cynnwys cyfeirio unrhyw gynnig i'r cyrff statudol perthnasol yn cynnwys CNC a phwyllgor yr AHNE.	
EN21 Lleoliadau ar gyfer Rheoli Gwastraff					
2.19	Yn gofyn am gyfeiriad at yr angen i olrhain yn gyfochrog	dd/b	Yn ei ymateb ar y Cynllun Adnau (Atodiad 2 yr ymateb hwnnw), gwnaeth CNC y sylw canlynol fel mater o eglurder, ac nid fel gwrthwynebiad:	Nodwyd, gwneir hyn drwy'r broses rheoli datblygu a awgrymwyd yn y cam cyngor cyn ymgeisio. Ychwanegir nodiadau cynghori i nodiadau penderfynu er mwyn dweud wrth	CNC yn dweud nad oes angen cytundeb. Mater o Eglurder yn

	ceisiadau am drwyddedau Id1080		*'Nodwn fod y safleoedd hyn yn debygol o orfod cael trwydded i weithredu ac nad yw rhoi caniatâd cynllunio yn sicrwydd y bydd trwydded yn cael ei rhoi. Dylid annog datblygwyr i olrhain ceisiadau cynllunio a thrwyddedau yn gyfochrog'.* Fel y cadarnhawyd yn ein hymateb ar y Cynllun Adnau, nid ystyriwn fod y mater hwn yn gysylltiedig â chadernid y cynllun.	ddatblygwyr gwastraff y gall fod angen trwyddedau amgylcheddol.	unig oedd y sylw hwn.

Casgliad

Cytunwyd ar y Datganiad Tir Cyffredin hwn gan:

Andrew Roberts Andrew Roberts, Rheolwr Gwasanaethau Strategaeth, Cyfadran yr Amgylchedd, Cyngor Sir y Fflint 21/01/21

Bryn Jones, Bryn Jones, Arweinydd Tîm, Gwasanaeth Cynghori Cynllunio Datblygu (Gogledd) CNC

Appendix 1

ARCADIS Design & Consultancy for natural and built assets

HABITATS REGULATIONS ASSESSMENT

Flintshire Local Development Plan

Screening Report

OCTOBER 2020

Incorporating

EC HARRIS BUILT ASSET CONSULTANCY

Hyder

CONTACTS

ALEX ELLIS

Arcadis.
Arcadis Cymru House,
St. Mellons Business
Park, Fortran Road,
Cardiff, CF3 0EY

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Screening Report

Author	Liz Turley
Checker	Joseph Evans
Approver	David Hourd
Report No	10010431-ARC-XX-XX-RP-TC-0005-01
Date	OCTOBER 2020

VERSION CONTROL

Version	Date	Author	Changes
01	September 2019	LT	First issue
02	25 September 2019	LT	Final issue
03	27 October 2020	AE	Amended to incorporate changes to the LDP

This report dated 27 October 2020 has been prepared for Flintshire County Council (the "Client") in accordance with the terms and conditions of appointment dated 07 June 2017(the "Appointment") between the Client and **Arcadis Consulting (UK) Limited** ("Arcadis") for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.

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1 INTRODUCTION

1.1 Purpose

1.1.1 This Habitats Regulations Assessment (HRA) Report has been prepared by Arcadis Consulting UK (Ltd) on behalf of Flintshire County Council as part of their review of the Local Plan. This Report comprises Stage 1 (the initial screening and detailed screening) of the HRA process. Further details of the HRA stages are provided in Section 2.

1.2 The Plan

1.2.1 Flintshire County Council is currently preparing its Local Development Plan (LDP) covering the timeframe 2015 to 2030. Once adopted, the LDP will replace the existing Flintshire Unitary Development Plan (UDP) and will become the framework against which decisions on planning applications are taken.

1.3 Local Plan Policies and Sites

1.3.1 There are 84 policies contained within the LDP. These are set out within Table 1. There are also 40 allocation sites (including residential, employment, mixed-use, retail and energy developments). The allocations are shown on the Policies maps which accompanies the LDP. The three main strategic objectives of the LDP comprise:

- Enhancing Community Life.
- Delivering Growth and Prosperity.
- Safeguarding the Environment.

1.3.2 The policies are set out within Table 2.

Table 1: Policies within the LDP

Overarching Policy Areas	Policies	Allocation site associated with policy
Strategic Policies		
Creating Sustainable Places and Communities	Policy STR1: Strategic Growth Policy STR2: The Location of Development	N/A
	Policy STR3: Strategic Sites	**Ref: STR3A**: Northern Gateway Mixed Use Development Site **Ref: STR3B**: Warren Hall Mixed Use Development Site
	Policy STR4: Principles of Sustainable Development, Design and Placemaking Policy STR5: Transport and Accessibility Policy STR6: Services, Facilities and Infrastructure	N/A
Supporting a Prosperous Economy	Policy STR7: Economic Development, Enterprise, and Employment Policy STR8: Employment Land Provision Policy STR9: Retail Centres and Development Policy STR10: Tourism, Culture, and Leisure	N/A
Meeting Housing Needs	Policy STR11: Provision of Sustainable Housing Sites	N/A

Overarching Policy Areas	Policies	Allocation site associated with policy
	Policy STR12: Provision for Gypsies and Travellers	
Valuing the Environment	Policy STR13: Natural and Built Environment, Green Networks and Infrastructure Policy STR14: Climate Change and Environmental Protection Policy STR15: Waste Management Policy STR16: Strategic Planning for Minerals	N/A
Development Management Policies (Topic, Criteria and Area Based Policies)		
Creating Sustainable Places and Communities	Policy PC1: The Relationship of Development to Settlement Boundaries Policy PC2: General Requirements for Development Policy PC3: Design Policy PC4: Sustainability and Resilience of New Development Policy PC5: Transport and Accessibility Policy PC6: Active Travel Policy PC7: Passenger Transport Policy PC8: Airport Safeguarding Zone Policy PC9: Protection of Disused Railway Lines Policy PC10: New Transport Schemes	N/A
	Policy PC11: Mostyn Docks	Mostyn Docks
	Policy PC12: Community Facilities	**Ref: PC12.1**: Community Centre, Woodlane **Ref: PC12.2**: Greenfield Cemetery **Ref: PC12.3**: Treuddyn Cemetery
Supporting a Prosperous Economy	Policy PE1: General Employment Land Allocations	**Ref: STR3A**: Northern Gateway Mixed Use Development Site **Ref: STR3B**: Warren Hall Mixed Use Development Site **Ref: PE1.1**: Chester Aerospace Park Ref: **Ref: PE1.2**: Manor Lane/Hawarden Park Extension **Ref: PE1.3**: Drury New Road **Ref: PE1.4**: Greenfield Business Park, Phase II **Ref: PE1.5**: Greenfield Business Park, Phase III **Ref: PE1.6**: Broncoed Industrial Estate **Ref: PE1.7**: Mold Business Park **Ref: PE1.8**: Adjacent Mostyn Docks

Overarching Policy Areas	Policies	Allocation site associated with policy
		Ref: PE1.9: Chester Road East **Ref: PE1.10**: Antelope Industrial Estate **Ref: PE1.11**: River Lane **Ref: PE1.12**: Rowley's Drive
	Policy PE2: Principal Employment Areas	**Ref: PE2.1**: Ewole Barns (Industrial Estate) Alltami **Ref: PE2.2**: Alltami Depot, Alltami **Ref: PE2.3**: Manor Industrial Estate, Bagillt **Ref: PE2.4**: Broughton Mills, Broughton **Ref: PE2.5**: Catheralls Industrial Estate and Pinfold Industrial Estate, Buckley **Ref: PE2.6**: Drury Lane Industrial Estate, Buckley **Ref: PE2.7**: Little Mountain Industrial Estate, Buckley **Ref: PE2.8**: Spencer Industrial Estate, Buckley **Ref: PE2.9**: Evans Business Centre, Chester West **Ref: PE2.10**: Dock Road, Connah's Quay **Ref: PE2.11**: Deeside Industrial Park, DARA and Northern Gateway, Deeside **Ref: PE2.12**: St Davids Park, Ewloe **Ref: PE2.13**: Ashmount Industrial Estate, Flint **Ref: PE2.14**: Castle Park/ Ashmount Industrial Centre, Flint **Ref: PE2.15**: Greenfield Business Park, Greenfield **Ref: PE2.16**: Hawarden Industrial Park, Chester Aerospace Park and Hawarden Airport, Hawarden **Ref: PE2.17**: Broncoed Industrial Estate, Mold **Ref: PE2.18**: Mold Business Park, Mold **Ref: PE2.19**: Mold Industrial Estate, Mold **Ref: PE2.20**: Mostyn Docks, Mostyn **Ref: PE2.21**: Pentre Industrial Estate, Pentre **Ref: PE2.22**: Queensferry Industrial Estate, Pentre

Overarching Policy Areas	Policies	Allocation site associated with policy
		Ref: PE2.23: Expressway Business Park, Queensferry **Ref: PE2.24**: Antelope Industrial Park, Rhydymwyn **Ref: PE2.25**: Brymau One, Two and Three Estates and Glen Industrial Estate, Saltney **Ref: PE2.26**: The Borders Industrial Park, Chesterbank Industrial Park and Brymau Four Estate, Saltney **Ref: PE2.27**: Engineer Park and St Ives Park, Sandycroft **Ref: PE2.28**: Glendale Business Park, Sandycroft **Ref: PE2.29**: Sandycroft Industrial Estate, Sandycroft **Ref: PE2.30**: Rowley's Drive, Shotton
	Policy PE3: Employment Development Outside Allocated Sites and Principal Employment Areas Policy PE4: Farm Diversification Policy PE5: Expansion of Existing Employment Uses Policy PE6: Protection of Employment Land Policy PE7: Retail Hierarchy	N/A
	Policy PE8: Development within Primary Shopping Areas	Land North of Broughton Park Land to the south of Chester Road
	Policy PE9: Development outside Primary Shopping Areas Policy PE10: District and Local Centres Policy PE11: Edge and Out of Town Retail Development Policy PE12: Tourist Accommodation, Facilities and Attractions Policy PE13: Caravan Development in the Open Countryside Policy PE14: Greenfield Valley	N/A
Meeting Housing Needs	Policy HN1: New Housing Development Proposals	**Ref: STR3A**: Northern Gateway Mixed Use Development Site **Ref: STR3B**: Warren Hall Mixed Use Development Site **Ref: HN1.1**: Well Street, Buckley **Ref: HN1.2**: Broad Oak, Holding, Mold Rd, Connah's Quay

Overarching Policy Areas	Policies	Allocation site associated with policy
		Ref: HN1.3: Highmere Drive, Connah's Quay **Ref: HN1.4**: Northop Road, Flint **Ref: HN1.5**: Maes Gwern, Mold **Ref: HN1.6**: Land between Denbigh Road and Gwerbaffield Rd, Mold **Ref: HN1.7**: Holywell Rd/Green Lane, Ewloe **Ref: HN1.8**: Ash Lane, Hawarden **Ref: HN1.9**: Wrexham Road, HCAC **Ref: HN1.10**: Cae Isa, A5119, New Brigton **Ref: HN1.11**: Chester Road, Penymynydd
	Policy HN2: Density and Mix of Development Policy HN3: Affordable Housing Policy HN4: Housing in the Countryside Policy HN4-A: Replacement Dwellings Policy HN4-B: Residential Conversion of Rural Buildings Policy HN4-C: Infill Development in Groups of Houses Policy HN4-D: Affordable Housing Exceptions Schemes Policy HN5: House Extensions and Alterations Policy HN6: Annex Accommodation Policy HN7: Houses in Multiple Occupation Policy HN9: Gypsy and Traveller Accommodation	N/A
	Policy HN8: Gypsy and Traveller Sites	**Ref: HN8.1**: Magazine Lane, Ewloe (Extension) **Ref: HN8.2**: Gwern Lane, Cae Estyn, Hope (Extension) **Ref: HN8.3**: Riverside, Queensferry (Extension) **Ref: HN8.4**: Castle Park Industrial Estate

Overarching Policy Areas	Policies	Allocation site associated with policy
Valuing the Environment	Policy EN1: Sports, Recreation and Cultural Facilities Policy EN2: Green Infrastructure Policy EN3: Undeveloped Coast and Dee Estuary Corridor Policy EN4: Landscape Character Policy EN5: Area of Outstanding Natural Beauty Policy EN6: Sites of Biodiversity Importance Policy EN7: Development Affecting Trees, Woodland and Hedgerows Policy EN8: Built Historic Environment and Listed Buildings Policy EN9: Development in or Adjacent to Conservation Areas Policy EN10: Buildings of Local Interest	N/A
	Policy EN11: Green Barriers	N/A
	Policy EN12: New Development and Renewable and Low Carbon Energy Technology	N/A
	Policy EN13: Renewable and Low Carbon Energy Development	**Ref: EN13.1**: Crumps Yard, Connah's Quay Solar Farm **Ref: EN13.2**: Castle Park Solar Farm
	Policy EN14: Flood Risk Policy EN15: Water Resources Policy EN16: Development on or near Landfill Sites or Derelict and Contaminated Land Policy EN17: Development of Unstable Land Policy EN18: Pollution and Nuisance Policy EN19: Managing Waste Sustainably Policy EN20: Landfill Buffer Zone Policy EN21: Locations for Waste Management Facilities Policy EN22: Criteria for Waste Management Facilities and Operations Policy EN23: Minerals Safeguarding Policy EN24: Minerals Buffer Zones	N/A
	Policy EN25: Sustainable Minerals Development	**Ref: EN25.1**: Extension to Hendre Quarry (Limestone) **Ref: EN25.2**: Extension to Pant y Pwll Dwr Quarry (Limestone)

Overarching Policy Areas	Policies	Allocation site associated with policy
		Ref: EN25.3: Extension to Ddol Uchaf Quarry (Sand and Gravel) **Ref: EN25.4**: Extension within Fron Haul Quarry (Sand and Gravel)
	Policy EN26: Criteria for Minerals Development Policy EN27: Secondary and Recycled Aggregate	N/A

2 THE HABITAT REGULATIONS ASSESSMENT PROCESS

2.1 Legislation and Guidance

2.1.1 This HRA is being made in accordance with the requirements of the following legislation and guidance:

- The Conservation of Habitats and Species Regulations 2017. In 2012, these Regulations were amended to transpose more clearly certain aspects of the Habitats Directive. In 2017, the Conservation of Habitats and Species Regulations 2017 (the "Habitats Regulations 2017") consolidated and updated the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations 2010").
- European Commission, Managing Natura 2000 sites: The provisions of Article 6 of the Habitats Directive 92/43/EEC.
- European Commission, Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC.
- Department for Communities and Local Government (2006) Planning for the Protection of European Sites: Appropriate Assessment. Guidance for Regional Spatial Strategies and Local Development Documents.
- Tyldesley D. and Chapman, C (2013) The Habitats Regulations Assessment Handbook (accessed July 2019) edition UK DTA Publications Limited www.dtapublications.co.uk.

2.2 Background to Habitats Regulations Assessment

2.2.1 Under Article 6 of the Habitats Directive (and Regulation 102 of the Habitats Regulations), an assessment is required where a land use plan may give rise to significant effects upon a Natura 2000 site (also known as a 'European site'). These designated sites form part of the Natura 2000 network, which is a network of areas designated to conserve natural habitats and species that are rare, endangered, vulnerable or endemic within the European Community. This includes SACs, designated under the Habitats Directive for their habitats and/or species of European importance, and SPAs, classified under Directive 2009/147/EC on the Conservation of Wild Birds (the codified version of Directive 79/409/EEC as amended) for rare, vulnerable and regularly occurring migratory bird species and internationally important wetlands.

2.2.2 In addition, it is a matter of law that candidate SACs (cSACs) and Sites of Community Importance (SCI) are considered in this process; furthermore, it is Government policy that sites designated under the 1971 Ramsar Convention for their internationally important wetlands (Ramsar sites) and potential SPAs (pSPAs) are also considered.

2.2.3 The requirements of the Habitats Directive are transposed into English and Welsh law by means of the Conservation of Habitats and Species (Amendment) Regulations 2017 (Conservation of Habitats and Species Regulations, 2016).

2.2.4 Regulation 61, Part 6 of the Habitats Regulations states that:

'*A competent authority, before deciding to undertake, or give consent, permission or other authorisation for, a plan or project which (a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects), and (b) is not directly connected with or necessary to the management of the site, must make an appropriate assessment of the implications for that site in view of that site's conservation objectives*.'.

2.2.5 Regulation 62, Part 6 of the Habitats Regulations states that:

'*If the competent authority are satisfied that, there being no alternative solutions, the plan or project must be carried out for imperative reasons of overriding public interest (which, subject to paragraph (2), may be of a social or economic nature), they may agree to the plan or project notwithstanding a negative assessment of the implications for the European site or the European offshore marine site (as the case may be).*'

2.2.6 Regulation 66, Part 6 of the Habitats Regulations states that:

'*Where, in accordance with regulation 62 (considerations of overriding public interest)— (a) a plan or project is agreed to, notwithstanding a negative assessment of the implications for a European site or a European offshore marine site, or (b) a decision, or a consent, permission or other authorisation, is affirmed on review, notwithstanding such an assessment,— the appropriate authority must secure that any necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000 is protected*.'

2.2.7 The overarching aim of HRA is to determine, in view of a site's conservation objectives and qualifying interests, whether a project, either in isolation and/or in combination with other projects, would have a significant adverse effect on the European site. If the Screening (the first stage of the process, see Section 2 for details) concludes that significant effects are likely, then Appropriate Assessment must be undertaken to determine whether there will be adverse effects on the site's integrity.

2.2.8 It should be noted that where the need for mitigation is identified to reduce a likely significant effect, then such measures cannot be included at the Screening Stage and the potential effects must be considered at within an Appropriate Assessment (Court of Justice of the European Union (CJEU) judgement (People over Wind & Sweetman v Coillte Teoranta Case C-323/17)).

2.3 Stages in HRA

2.3.1 The requirements of the Habitats Directive comprise four distinct stages:

1. **Stage 1: Screening** is the process which initially identifies the likely impacts upon a European site of a project or plan, either alone or in combination with other projects or plans, and considers whether these impacts may have a significant effect on the integrity of the site's qualifying habitats and/or species. It is important to note that the burden of evidence is to show, on the basis of objective information, that there will be no significant effect; if the effect may be significant, or is not known, that would trigger the need for an Appropriate Assessment. There is European Court of Justice case law to the effect that unless the likelihood of a significant effect can be ruled out on the basis of objective information, and adopting the precautionary principle, then an Appropriate Assessment must be made. The April 2018 CJEU judgement determined that mitigation to avoid or reduce harmful effects of the plan or project on a European site cannot be taken into account at the screening stage (Stage 1). Where such measures are required, a plan or project will require Appropriate Assessment to be undertaken (Stage 2).
2. **Stage 2: Appropriate Assessment** is the detailed consideration of the impact on the integrity of the European site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's conservation objectives and its structure and function. This is to determine whether or not there will be adverse effects on the integrity of the site. This stage also includes the development of mitigation measures to avoid or reduce any possible impacts.
3. **Stage 3: Assessment of alternative solutions** is the process which examines alternative ways of achieving the objectives of the project or plan that would avoid adverse impacts on the integrity of the European site, should avoidance or mitigation measures be unable to cancel out adverse effects.
4. **Stage 4: Assessment where no alternative solutions exist and where adverse impacts remain.** At Stage 4, an assessment is made with regard to whether or not the development is necessary for imperative reasons of overriding public interest (IROPI). If it is, this stage also involves detailed assessment of the compensatory measures needed to protect and maintain the overall coherence of the Natura 2000 network.

2.4 In combination Effects

2.4.1 As outlined in Section 2.4, it is necessary for HRA to consider in combination effects with other projects or plans.

2.4.2 Where an aspect of a project could have some effect on the qualifying feature(s) of a European site, but the effects of that aspect of the project alone would not be significant, the effects will need to be

checked in combination, firstly with other effects of the same project, and then with the effects of any other plans and projects.

2.4.3 If the prospect of cumulative effects cannot be eliminated, it is necessary to consider how the addition of effects from other projects or plans may produce a combined adverse effect on a European site that would be significant. Taking the effects which would not be likely to be significant alone, it is necessary to make a judgement as to whether these effects would be made more likely or more significant if the effects of other projects or plans are added to them. Most cumulative effects can be identified by way of the following characteristics. Could additional effects be cumulative because they would:

a. Increase the effects on the qualifying features in an additive, or synergistic way?
b. Increase the sensitivity or vulnerability of the qualifying features of the site affected by the project proposals?
c. Be felt more intensely by the same qualifying features over the same area (a layering effect), or by the same qualifying feature over a greater (larger) area (a spreading effect), or by affecting new areas of the same qualifying feature (a scattering effect)?

2.4.4 In accordance with Tyldesley D. and Chapman, C (2013) The Habitats Regulations Assessment Handbook (accessed July 2019) edition UK DTA Publications Limited www.dtapublications.co.uk, it will be necessary to look for projects and plans at the following stages:

a. Applications lodged but not yet determined.
b. Projects subject to periodic review e.g. annual licences, during the time that their renewal is under consideration.
c. Refusals subject to appeal procedures and not yet determined.
d. Projects authorised but not yet started.
e. Projects started but not yet completed.
f. Known projects that do not require external authorisation.
g. Proposals in adopted plans.
h. Proposals in finalised draft plans formally published or submitted for final consultation, examination or adoption.

2.4.5 Plans under consideration may range from neighbouring authorities' planning documents down to sector-specific strategic plans on such topics as flood risk.

2.4.6 A review has been undertaken of projects and plans with the potential for an in combination effect with the proposed development.

2.5 Definition of Significant Effects

2.5.1 A critical part of the HRA screening process is determining whether or not the proposals are likely to have a significant effect on European sites and, therefore, if they will require an Appropriate Assessment. Judgements regarding significance should be made in relation to the qualifying interests for which the site is of European importance and also its conservation objectives. A useful definition of 'likely' significant effects is as follows:

'*…likely means readily foreseeable not merely a fanciful possibility; significant means not trivial or inconsequential but an effect that is potentially relevant to the site's conservation objectives'* (Welsh Assembly Government, 2006).

2.5.2 In considering whether the project is likely to have a significant effect on a European site, a precautionary approach must be adopted:

- The project should be considered 'likely' to have such an effect if the applicant is unable (on the basis of objective information) to exclude the possibility that the project could have significant effects on any European site, either alone or in combination with other plans or projects.
- An effect will be 'significant' in this context if it could undermine the site's conservation objectives. The assessment of that risk must be made in the light of factors such as the characteristics and specific environmental conditions of the European site in question.

2.6 Approach to the HRA Report

2.6.1 This HRA Report takes into account the requirements of the Habitats Regulations and relevant guidance produced by David Tyldesley (Tyldesley D. and Chapman, C (2013) The Habitats Regulations Assessment Handbook (accessed July 2019) edition UK DTA Publications Limited www.dtapublications.co.uk).

2.6.2 The following stages have been completed:

- Identification of all European sites potentially affected (including those outside of the proposed development boundary);
- A review of each European site, including the features for which the site is designated, the Conservation Objectives, and an understanding of the current conservation status and the vulnerability of the individual features to threats;
- A review of the proposals which have the potential to affect the European sites, and whether the sites are vulnerable to these effects; and
- A consideration of any potential impacts in combination with other projects (or plans).

3 IDENTIFYING THE EUROPEAN SITES

3.1 Approach to Identifying Sites

3.1.1 All European sites which may be affected by proposed development (through an identifiable impact pathway) have been considered from within 20 km of the borough boundary.

3.2 European Sites identified

3.2.1 Twenty-three European sites have been identified. A list of the sites together with their status and location is presented in Table 2. Figure 1, Appendix B also shows the locations of the European sites identified within and adjacent to the district boundary.

Table 2: Summary of European Sites

Name of Site	Identification Number	Status	Distance from Flintshire boundary (approximate km)
Dee Estuary	UK00082	Ramsar site	Within
Dee Estuary	UK9013011	SPA	Within
Dee Estuary	UK0030131	SAC	Within
Deeside and Buckley Newt sites	UK0030132	SAC	Within
Halkyn Mountain	UK0030163	SAC	Within
Alyn Valley Woods	UK0030078	SAC	Within
Liverpool Bay	UK9020294A	SPA	Marine SPA adjacent to the northwest boundary
River Dee and Bala Lake	UK0030252	SAC	Adjacent to southeast boundary
Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains	UK0012926	SAC	Adjacent to the southern boundary
Berwyn	UK9013111	SPA	Adjacent to the southern boundary
Llwyn	UK0030185	SAC	5
Coedwigoedd Dyffryn Elwy / Elwy Valley Woods	UK0030146	SAC	7
Johnstown Newt Sites	UK0030173	SAC	7
Mersey narrows & north Wirral foreshore	UK11042	Ramsar site	7.2
Mersey narrows & north Wirral foreshore Ramsar site	UK9020287	SPA	7.2
Mersey Estuary	UK11041	Ramsar site	9.4
Mersey Estuary	UK9005131	SPA	9.4

Name of Site	Identification Number	Status	Distance from Flintshire boundary (approximate km)
Ribble and Alt Estuaries	UK11057	Ramsar site	18.9
Ribble and Alt Estuaries	UK9005103	SPA	18.9
Midland Meres and Moses Phase 1	UK11043	Ramsar site	24.5
Midland Meres and Moses phase 2	UK11080	Ramsar site	4.7
Oak Mere	UK0012970	SAC	18.5
Sefton Coast	UK0013076	SAC	18.7

4 INITIAL SCREENING

4.1 Screening Approach

4.1.1 The screening process has been split into two stages, initial screening and detailed screening.

4.1.2 The initial screening stage has provided a high-level screening assessment to determine if the LDP could possibly lead to significant adverse effects on European sites identified in Section 3. The purpose of this was to eliminate those policies and sites from the assessment which very clearly would not affect European sites in order to focus on those policies and sites where there was potential for effects or uncertainty about potential effects.

4.1.3 When identifying the elements of the LDP that could potentially affect European sites, it was important to focus upon those elements that would have the greatest likelihood of impacting the sites. The definition of significance identified in Section 2.5 was very important for the detailed screening.

4.1.4 The LDP is intended to be read as a single document rather than a series of separate policies and has been assessed as such. Proposals in one area of the LDP may mitigate potentially damaging activities promoted in another area and should be understood in the wider context of the Plan's aims and purposes.

4.1.5 The sections below outline the initial and detailed screening of the LDP.

4.2 European sites

4.2.1 European sites screened out in the initial screening comprised those European sites where there was no clear link, or conceivable impact pathway between the European sites and the policies/sites set out within the LDP. Those European sites with the potential for Likely Significant Effects (LSE) as a result of implementation of the LDP, or those European sites for which impacts were uncertain, were carried forward into the more detailed screening assessment.

European sites screened in

4.2.2 Five European sites have been screened in for further assessment. These are listed in Table 3, and are shown on Figure 1, Appendix B. Details of the qualifying features of each of these European sites are shown below.

Table 3: Summary of European Sites screened in

Name of Site
Dee Estuary SPA
Dee Estuary SAC
Dee Estuary Ramsar site
River Dee and Bala Lake SAC
Deeside and Buckley Newt SAC

Dee Estuary SPA

The site citation (JNCC, 2001) provides the species and numbers of birds which form qualifying features of features of the SPA, these are provided in

4.2.3 Table 4, below. The citation specifies these species in their non-breeding, over-wintering state.

Table 4: Qualifying Features of the Dee Estuary SPA

Species	Count
This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:	
Breeding;	
Little Tern *Sterna albifrons*	56 pairs representing at least 2.3% of the breeding population in Great Britain (RSPB, 5 year mean 1991-95)
Common Tern *Sterna hirundo*	277 pairs representing at least 2.3% of the breeding population in Great Britain (5 year mean 1991-95)
On passage;	
Sandwich Tern *Sterna sandvicensis*	818 individuals representing at least 5.8% of the population in Great Britain (5 year mean 1991-95)
Overwinter;	
Bar-tailed Godwit *Limosa lapponica*	1,013 individuals representing at least 1.9% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6)
This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:	
On passage;	
Redshank *Tringa totanus*	8,451 individuals representing at least 4.8% of the Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
Over winter;	
Black-tailed Godwit *Limosa limosa islandica*	1,739 individuals representing at least 2.5% of the wintering Iceland - breeding population (5 year peak mean 1991/2 - 1995/6)
Curlew *Numenius arquata*	4,028 individuals representing at least 1.2% of the wintering Europe - breeding population (5 year peak mean 1991/2 - 1995/6)
Dunlin *Calidris alpina alpina*	22,479 individuals representing at least 1.6% of the wintering Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/2 - 1995/6)
Grey Plover *Pluvialis squatarola*	2,193 individuals representing at least 1.5% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
Knot *Calidris canutus*	21,553 individuals representing at least 6.2% of the wintering North eastern Canada/Greenland/Iceland/North western Europe population (5 year peak mean 1991/2 - 1995/6)
Oystercatcher *Haematopus ostralegus*	28,434 individuals representing at least 3.2% of the wintering Europe & Northern/Western Africa population (5 year peak mean 1991/2 - 1995/6)
Pintail *Anas acuta*	6,498 individuals representing at least 10.8% of the wintering North western Europe population (5 year peak mean 1991/2 - 1995/6)

Species	Count
Redshank *Tringa totanus*	6,382 individuals representing at least 4.3% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
Shelduck *Tadorna tadorna*	6,827 individuals representing at least 2.3% of the wintering North western Europe population (5 year peak mean 1991/2 - 1995/6)
Teal *Anas crecca*	5,918 individuals representing at least 1.5% of the wintering North western Europe population (5 year peak mean 1991/2 - 1995/6)
Assemblage qualification: A wetland of international importance. The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl. Over winter, the area regularly supports 130,408 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Black-tailed Godwit, Shelduck, Teal, Pintail, Oystercatcher, Grey Plover, Bar-tailed Godwit *Limosa lapponica*, Dunlin, Sanderling *Calidris alba*, Curlew, Redshank, Cormorant *Phalacrocorax carbo*, Wigeon *Anas penelope*, Mallard *Anas platyrhynchos*, Lapwing *Vanellus vanellus*, Knot.	

Dee Estuary Ramsar site

4.2.4 The site citation (JNCC, 2011) provides the species and numbers of birds which form qualifying features of the Ramsar site, these are provided in Table 5.

Table 5: Qualifying Features of the Dee Estuary Ramsar site

Species	Count
Ramsar criterion 1: Extensive intertidal mud and sand flats (20 km by 9 km) with large expanses of saltmarsh towards the head of the estuary. Habitats Directive Annex I features present on the pSAC include: H1130 Estuaries H1140 Mudflats and sandflats not covered by seawater at low tide H1210 Annual vegetation of drift lines H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts H1310 *Salicornia* and other annuals colonising mud and sand H1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) H2110 Embryonic shifting dunes H2120 Shifting dunes along the shoreline with *Ammophila arenaria* (“white dunes”) H2130 Fixed dunes with herbaceous vegetation (“grey dunes”) H2190 Humid dune slacks	
Ramsar criterion 2: It supports breeding colonies of the vulnerable Natterjack Toad, *Epidalea calamita*	
Ramsar criterion 5: **Assemblages of international importance:** Species with peak counts in winter:	

Species	Count
Non-breeding season regularly supports 120,726 individual waterbirds (5 year peak mean 1994/5 – 1998/9).	
Ramsar criterion 6: Species/populations occurring at levels of international importance. **Qualifying Species/populations (as identified at designation):** **Species with peak counts in spring/autumn:**	
Redshank, *Tringa totanus*,	8,795 individuals, representing an average of 5.9% of the Eastern Atlantic population (5 year peak mean 1994/95 - 1998/99)
Species with peak counts in winter:	
Teal, *Anas crecca*, NW Europe	5,251 individuals, representing an average of 1.3% of the population (5 year peak mean 1994/95 - 1998/99)
Shelduck, *Tadorna tadorna*, NW Europe	7,725 individuals, representing an average of 2.6% of the population (5 year peak mean 1994/95 - 1998/99)
Oystercatcher, *Haematopus ostralegus*, Europe & W Africa	22,677 individuals, representing an average of 2.5% of the population (5 year peak mean 1994/95 - 1998/99)
Curlew, *Numenius arquata* Europe/NW Africa	3,899 individuals, representing an average of 1.1% of the Europe population (5 year peak mean 1994/95 - 1998/99)
Pintail, *Anas acuta*, NW Europe	5,407 individuals, representing an average of 9.0% of the population (5 year peak mean 1994/95 - 1998/99)
Grey plover, *Pluvialis squatarola*, E Atlantic	1,643 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1994/95 - 1998/99)
Knot, *Calidris canutus islandica*, W Europe/ Canada	12,394 individuals, representing an average of 3.5% of the GB population (5 year peak mean 1994/95 - 1998/99)
Dunlin, *Calidris alpina alpina* Europe (breeding)	27,769 individuals, representing an average of 2.0% of the population (5 year peak mean 1994/95 - 1998/99)
Black-tailed godwit, *Limosa limosa islandica*, Iceland (breeding)	1,747 individuals, representing an average of 2.5% of the population (5 year peak mean 1994/95 - 1998/99)
Bar-tailed godwit, Limosa lapponica , W European (wintering)	1,150 individuals, representing an average of 1.2% of the Europe population (5 year peak mean 1994/95 - 1998/99)
Redshank, *Tringa totanus*, Eastern Atlantic	5,293 individuals representing an average of 3.5% Eastern Atlantic population (5 year peak mean 1994/95 - 1998/99)
Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm. Details of bird species occurring at levels of National importance are given in Section 22.	

Dee Estuary SAC

4.2.5 The site citation (JNCC, 2015(a)) provides the habitats and species which form qualifying features of the SAC, these are provided in Table 6, below.

Table 6: Qualifying Features of the Severn Estuary SAC

Qualifying habitats and species
Annex I habitats that are a primary reason for selection of this site:
1140 Mudflats and sandflats not covered by seawater at low tide
1310 Salicornia and other annuals colonizing mud and sand
1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:
1130 Estuaries
1210 Annual vegetation of drift lines
1230 Vegetated sea cliffs of the Atlantic and Baltic Coasts
2110 Embryonic shifting dunes
2120 "Shifting dunes along the shoreline with Ammophila arenaria (""white dunes"")"
2130 "Fixed coastal dunes with herbaceous vegetation (""grey dunes"")"
2190 Humid dune slacks
Annex II species that are a primary reason for selection of this site:
Not applicable
Annex II species present as a qualifying feature, but not a primary reason for site selection:
1095 Sea lamprey *Petromyzon marinus*
1099 River lamprey *Lampetra fluviatilis*
1395 Petalwort *Petalophyllum ralfsii*

River Dee and Bala Lake SAC

4.2.6 The site citation (JNCC, 2015(c)) provides the habitats and species which form qualifying features of the SAC, these are provided in Table 7, below.

Table 7: Qualifying Features of the River Dee and Bala Lake SAC

Qualifying habitats and species
Annex I habitats that are a primary reason for selection of this site:
3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:
Not applicable
Annex II species that are a primary reason for selection of this site:
Atlantic salmon *Salmo salar*

Qualifying habitats and species
1831 Floating water-plantain *Luronium natans*
Annex II species present as a qualifying feature, but not a primary reason for site selection:
1095 Sea lamprey *Petromyzon marinus*
1096 Brook lamprey Lampetra planeri
1099 River lamprey *Lampetra fluviatilis*
1163 Bullhead *Cottus gobio*
1355 Otter *Lutra lutra*

Deeside and Buckley Newt SAC

4.2.7 The site citation (JNCC, 2015(c)) provides the habitats and species which form qualifying features of the SAC, these are provided in Table 8, below.

Table 8: Qualifying Features of the Deeside and Buckley Newt SAC

Qualifying habitats and species
Annex I habitats that are a primary reason for selection of this site:
Not applicable
Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:
91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
Annex II species that are a primary reason for selection of this site:
1166 Great crested newt *Triturus cristatus*
Annex II species present as a qualifying feature, but not a primary reason for site selection:
Not applicable

Conservation Objectives of the European Sites screened in

4.2.8 Under Regulation 35(3) of the Conservation of Habitats and Species Regulations 2017 (as amended) the appropriate statutory nature conservation body (in this case NRW) has a duty to communicate the conservation objectives for a European site to the relevant/competent authority responsible for that site. The information provided under Regulation 35 must also include advice on any operations which may cause deterioration of the features for which the site is designated.

4.2.9 The conservation objectives for a European site are intended to represent the aims of the Habitats and Birds Directives in relation to that site. To this end, habitats and species of European Community importance should be maintained or restored to 'favourable conservation status' (FCS), as defined in Article 1 of the Habitats Directive below:

The conservation status of a natural habitat will be taken as 'favourable' when:

- *Its natural range and the area it covers within that range are stable or increasing;*
- *The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and*
- *Conservation status of typical species is favourable as defined in Article 1(i).*

The conservation status of a species will be taken as favourable when:

- *Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;*
- *The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and*
- *There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.*

4.2.10 Guidance from the European Commission indicates that the Habitats Directive intends FCS to be applied at the level of an individual site, as well as to habitats and species across their European range. Therefore, in order to properly express the aims of the Habitats Directive for an individual site, the conservation objectives for a site are essentially to maintain (or restore) the habitats and species of the site at (or to) FCS.

European sites screened out

4.2.11 European sites screened out comprised those European sites where there was no realistic link, or conceivable impact pathway between the European sites and the policies/sites set out within the LDP. A justification for screening out European sites is presented in Table 9.

Table 9: Summary of European Sites screened out

Name of Site	Justification for screening out
Mersey narrows & north Wirral foreshore Ramsar site/ SPA	The qualifying features of this site comprise bar-tailed godwit, common tern, knot and little gull. No element of the Local Plan would impact on these species given their preference for foreshore habitats. Due to the distance of the SPA/Ramsar site from the County boundary (8 km) potential impacts associated with: hydrological links, air quality, direct habitat loss, recreational pressure and disturbance/ displacement of birds during the construction phase of new development within Flintshire have also been screened out of further assessment.
Mersey Estuary Ramsar site/ SPA	The qualifying features of these sites comprise shelduck, black-tailed godwit, redshank, Eurasian teal, northern pintail and dunlin. No element of the Local Plan would impact on these species given their preference for foreshore habitats. Due to the distance of the SPA/ Ramsar site from the County boundary (9 km) potential impacts associated with: hydrological links, air quality, direct habitat loss, recreational pressure and disturbance/ displacement of birds during the construction phase of new development within Flintshire have also been screened out of further assessment.
Ribble and Alt Estuaries Ramsar site/ SPA	Given the distance of SPA/ Ramsar site from the County boundary (26 km from the nearest allocation) potential impacts associated with: hydrological links, air quality, direct habitat loss, recreational pressure, loss of functionally linked land, disturbance/ displacement of birds using functionally linked land adjacent to development and disturbance/ displacement of birds during the construction phase of new development within Flintshire have been screened out of further assessment.
Midland Meres and Moses phase 1 Ramsar site	The qualifying features of this site comprise a range of wetland habitats including open water and raised bog, and a number of rare plants and invertebrates associated with these habitats. The site is approximately

Name of Site	Justification for screening out
	25 km from the nearest allocation and there are no hydrological links between them or any other allocation within the authority. Given the distance of SAC from the County boundary (20 km) potential impacts associated with: air quality, direct habitat loss, and recreational pressure have also been screened out of further assessment.
Midland Meres and Moses phase 2 Ramsar site	This site is also designated for its wetland habitats and the plant and invertebrate species that it supports. It consists of a number of isolated parcels, the majority of which are the other side of Wrexham from any allocation. The closest parcel is approximately 6.3 km from the nearest allocation and separated by a major road and railway. There are no hydrological links between the site and any allocation. Given the distance of SAC from the County boundary (5 km) potential impacts associated with: air quality, direct habitat loss, and recreational pressure have also been screened out of further assessment.
Oak Mere SAC	The site's qualifying features include oligotrophic waters, transition mires and quaking bogs. Its approximately 24 km from the nearest allocation with no hydrological links between this or any allocation. Due to the distance of SAC from the County boundary (18 km) potential impacts associated with: hydrological links, air quality, direct habitat loss, and recreational pressure have been screened out of further assessment.
Sefton Coast SAC	The qualifying features of this site comprise dune habitats supporting petalwort and great crested newt. The site is approximately 28 km from the nearest allocation. Given the distance of SAC from the County boundary (19 km) potential impacts associated with: hydrological links, air quality, direct habitat loss, and recreational pressure have been screened out of further assessment.
Coedwigoedd Dyffryn Elwy / Elwy Valley Woods SAC	The qualifying features of the site comprise Tilio-Acerion forests of slopes, screes and ravines habitat. Given the distance of SAC from the County boundary (7 km) potential impacts associated with: hydrological links, air quality, direct habitat loss, and recreational pressure have been screened out of further assessment.
Johnstown Newt Sites SAC	The qualifying feature of this site is great crested newt. Given the distance of SAC from the County boundary (7 km) potential impacts on the great crested newt population have been screened out of further assessment.
Llwyn SAC	The qualifying feature of the site comprises Alluvial forests with Alnus glutinosa and Fraxinus excelsior habitat. Given the distance of SAC from the County boundary (5 km) potential impacts associated with: hydrological links, air quality, direct habitat loss, and recreational pressure have been screened out of further assessment.
Halkyn Mountain SAC	The qualifying features of this site comprise grassland habitat supporting great crested newt. Although this site is within the district boundary it is approximately 3 km from the nearest allocation with no hydrological links to this or any allocation. This site has been screened out of further assessment.

Name of Site	Justification for screening out
Alyn Valley Woods SAC	The qualifying features of this site comprise forest, grassland and scrubland habitats. This site is within the district boundary and is approximately 2.5 km from its nearest allocation. Although the site is directly linked to this allocation via the River Alyn, the allocation is downstream of the SAC and therefore any major pollution event would not impact on these features. This site has been screened out of further assessment.
Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains SAC	The primary qualifying features of this site include European dry heath and blanket bog habitats. The site is 12.4 km from the authority boundary and there are no direct hydrological pathways linking this site to the authority. This site has been screened out of further assessment.
Berwyn SPA	This site overlaps with Berwyn and South Clwyd Mountains (above). Its qualifying features include hen harrier, merlin and peregrine (breeding). The site is 12.4 km from the authority boundary. Given the distance of the SPA from Flintshire, no likely significant potential impact pathways have been identified. This site has been screened out of further assessment.
Liverpool Bay SPA	This site is located adjacent to the northern authority boundary. It is classified for the protection of red-throated diver, common scoter, and little gull in the non-breeding season; common tern and little tern in the breeding season, and an internationally important waterbird assemblage. Given that the qualifying birds of the SPA are marine foraging species, no elements of the LDP would have a likely significant effect on the SPA. This site has been screened out of further assessment.

4.3 Initial screening of policies and allocations within the LDP

4.3.1 Policies screened out in the initial screening were generally those that could not lead to 'direct development' or could have no impact pathway to any of the European sites identified. This included policies which directly seek to protect the local historic and natural environment, or those which support the implement other policies and therefore could not directly affect European sites. All of the policies screened out of the detailed assessment are not directly linked to allocation sites.

4.3.2 As set out with the DTA HRA Guidance (Part F)[1], each of the polices within the LDP have been reviewed against the following list of screening categories.

Table 10: Screening Assessment Categories

Category	Description
Category A:	**General statements of policy/general aspirations.** Policies which are no more than general statements of policy or general political aspirations should be screened out because they cannot have a significant effect on a site.
Category B:	**Policies listing general criteria for testing the acceptability/sustainability of proposals**. These general policies cannot have any effect on a European site and should be screened out.
Category C:	**Proposal referred to but not proposed by the plan.** Screen out any references to specific proposals for projects, such as those which are identified, for example, in higher policy frameworks such as the Wales Spatial Plan or National Policy Statements, relating perhaps to nationally

[1] Tyldesley D. and Chapman, C (2013) The Habitats Regulations Assessment Handbook (accessed July 2019) edition UK DTA Publications Limited www.dtapublications.co.uk

Category	Description
	significant infrastructure projects. These will be assessed by the Secretary of State or Welsh Ministers. A useful 'test' as to whether a project should be screened out in this step is to ask the question: 'Is the project provided for/proposed as part of another plan or programme and would it be likely to proceed under the other plan or programme irrespective of whether this subject plan is adopted with or without reference to it?' If the answer is 'yes' it will normally be appropriate to screen the project out in this step.
Category D:	**General plan-wide environmental protection/site safeguarding/ threshold policies**. These are policies, the obvious purpose of which is to protect the natural environment, including biodiversity, or to conserve or enhance the natural, built or historic environment, where enhancement measures will not be likely to have any adverse effect on a European Site. They can be screened out because the implementation of the policies is likely to protect rather than adversely affect European sites and not undermine their conservation objectives.
Category E:	**Policies or proposals that steer change in such a way as to protect European sites from adverse effects**. These types of policies or proposals will have the effect of steering change away from European sites whose qualifying features may be affected by the change and they can therefore be screened out.
Category F:	**Policies or proposals that cannot lead to development or other change.** Policies that do not themselves lead to development or other change, for example, because they relate to design or other qualitative criteria for development, such as materials for new development. They do not trigger any development or other changes that could affect a European site and can be screened out.
Category G:	**Policies or proposals that could not have any conceivable adverse effect on a site**. Policies which make provision for change, but which could have no conceivable effect on a European site, because there is no causal connection or link between them and the qualifying features of any European site and can therefore be screened out.
Category H:	**Policies or proposals the (actual or theoretical) effects of which cannot undermine the conservation objectives (either alone or in combination with other aspects of this or other plans or projects).** Policies or proposals which make provision for change but which could have no significant effect on a European site, either alone or in combination with other aspects of the same plan, or in combination with other plans or projects, can be screened out. These may include cases where there are some potential effects which (and theoretically even in combination) would plainly be insignificant and could not undermine the conservation objectives.
Category I:	**Policies or proposals which may have a significant effect on a site alone.** Policies or proposals which are likely to have a significant effect on a European site alone, should be screened in.
Category J:	**Policies or proposals unlikely to have a significant effect alone.** These aspects of the plan would have some effect on a site, but the effect would not be likely to be a significant effect; so they must be checked for in combination (cumulative) effects. They will then be re-categorised as either Category K (no significant effect in combination) or Category L (likely to have a significant effect in combination), as explained below.
Categories K and L:	**Policies or proposals unlikely to have a significant effect either alone or in combination (K) or likely to have a significant effect in combination (L) after the in-combination test.** Where an aspect of a plan could have some effect on the qualifying feature(s) or a European site, but the effects of that aspect of the plan alone would not be significant, the effects of that aspect of the plan will need to be checked in combination firstly, with other effects of the same plan, and then with the effects of other plans and projects.

Category	Description
	i.e. policies or proposals which will have no likely significant effect alone or in combination are classified as Category K. Policies or proposals which are likely to have a significant effect in combination are classified as Category L. Category L policies or proposals will require further consideration in terms of potential in combination effects. Firstly, this will be with regard to other aspects of the Plan itself, and subsequently with other separate plans or projects, for example neighbouring Local Plans.
Category M:	**Bespoke area, site or case specific policies or proposals intended to avoid or reduce harmful effects on European sites.** Policies or proposals which have been included in the plan with the intension of avoiding or reducing effects on specific European site(s) whose qualifying features may otherwise be affected by the plan being implemented.

4.3.3 Based on the categories set out within Table 10, 74 policies have been screened out of further assessment. Table 11 provides a summary of the screening exercise. Justification for the conclusions is included within Table 11. The remaining policies (which all link to allocation sites) have been carried forward into the detailed screening. All allocations listed within the LDP have been carried through to detailed screening.

Table 11: Screening of LDP policies

LDP Policies	Justification	Conclusion
STR1: Strategic Growth	This policy confirms Flintshire's economic ambition for the plan period. This policy is aspirational and would not lead directly to impacts on European sites.	**Category A** **(Screened out)**
STR2: The Location of Development	This policy provides details of the areas where new development will be directed during the plan period. This policy is aspirational and would not lead directly to impacts on European sites.	
STR5: Transport and Accessibility PC5: Transport and Accessibility PC6: Active Travel	These policies provide details of how new development can only be delivered by *the maintenance and enhancement of an integrated, accessible, usable, safe and reliable transport network* (ST5) and *must be supported by appropriate transport infrastructure, and depending on the nature, scale, location and siting of the proposal* (PC5). New development proposals should also *ensure that people have access to employment, education, healthcare and other essential services and facilities* (PC6). These are general statements of policy and will not impact on European sites.	
STR6: Services, Facilities and Infrastructure	This policy set outs the aspirations for community planning and do not directly link to development. This is a general statement of policy and will not impact on European sites.	
STR7: Economic Development, Enterprise and Employment STR8: Employment Land Provision	Policy STR6 details how Flintshire will sustain its role as a sub-regional economic hub and Policy STR8 details how land will be provided for employment during the plan period. These are general statements of policy and will not impact on European sites.	
STR11: Provision of Sustainable Housing Sites	This policy confirms the council's commitment in favour of sustainable development that would not impact on European sites.	

PC1: The Relationship of Development to Settlement Boundaries	This policy sets out where development will be permitted within settlement boundaries. This is a general statement of policy and will not impact on European sites.	
PC8: Airport Safeguarding Zone	This is a safeguarding policy. *Development will not be permitted which would prejudice the safe and efficient operation of Hawarden Airport.* This is a general statement of policy and will not impact on European sites.	
EN23: Minerals Safeguarding	This is a safeguarding policy. This is a general statement of policy to accompany Policy STR16 and will not impact on European sites.	
PE7: Retail Centre Hierarchy	This policy sets out where retail, leisure and commercial development will be directed. This policy is aspirational and would not lead directly to impacts on European sites.	
PC2: General Requirements for Development PC4: Sustainability and Resilience of New Development	These policies detail the general requirements (PC2) and sustainability criteria (PC4) which all new developments must adhere to. Implementing these policies will not affect European sites.	**Category B** **(Screened out)**
PC7: Passenger Transport	This policy sets out the criteria which new development must adhere to, to promote the use of passenger transport. Implementing this policy will not affect European sites.	
PC9: Protection of Disused Railway Lines	This policy confirms the Council's commitment to protect existing disused railway lines for the purposes of walking, cycling, horse riding or other transport schemes. Implementing this policy will not affect European sites.	
PE3: Employment Development Outside Allocated Sites and Principal Employment Areas	This policy sets out the criteria which must be met in order to develop employment land outside of the allocations within the LDP. However, the policy itself would not lead to development. Implementing this policy will not affect European sites.	
PE5: Expansion of Existing Employment uses PE6: Protection of Employment Land	These policies outline the criteria which must be met by developers wanting to extend existing employment sites (PE5) or wanting to change the use of an existing employment site (PE6). Implementing this policy will not affect European sites.	
PE13: Caravan Development in the Open Countryside	This policy sets the criteria for the location of new caravan sites in the countryside but does not itself lead to development. Implementing this policy will not affect European sites.	
HN5: House Extensions and Alterations HN6: Annex Accommodation HN7: Houses in Multiple Occupation	These polices set the criteria for new development associated with extensions to existing premises (HN5), new annexes to existing buildings (HN6), and conversions of existing buildings into one or more dwellings (HN7). Implementing this policy will not affect European sites.	
EN1: Sports, Recreation and Cultural Facilities	This policy relates to protection of existing facilities and circumstances under which these can be changed. Implementing this policy will not affect European sites.	
EN3: Undeveloped Coast and Dee Estuary Corridor	This policy sets out the criteria which must be met in relation to potential development along the coast but does not itself lead to	

	development. Implementing this policy will not affect European sites	
EN17: Development of Unstable Land	This policy ensures that development is not permitted in areas subject to instability due to mining, landfill, landslides, erosion, or other subsidence. Implementing this policy will not affect European sites.	
EN22: Criteria for Waste Management Facilities and Operations	This policy sets out the criteria which Waste Management Facilities must adhere to but does not itself lead to development. Implementing this policy will not affect European sites.	
EN26: Criteria for Minerals Development	This policy relates to the criteria which future minerals development projects must adhere to but does not itself lead to development. Implementing this policy will not affect European sites.	
EN20: Landfill Buffer Zone EN24: Minerals Buffer Zones	These policies protect existing development from landfill and minerals development. Neither policy would lead to development. Implementing this policy will not affect European sites	
EN27: Secondary and Recycled Aggregate	This policy relates to criteria which must be met for any proposals for the management of secondary and recycled aggregates. The policy itself will not lead to development. Implementing this policy will not affect European sites.	
STR12: Provision for Gypsies and Travellers HN9: Gypsy and Traveller Accommodation	These policies relate to accommodation for gypsies and travellers. Policy STR12 states that *appropriate, site specific provision of socially rented and private pitches, extension of existing private sites, provision for transit and stopping places, and a criteria-based policy to judge the appropriateness of planning applications for new sites as they arise*. These policies set criteria for the location of gypsy and travellers sites but do not directly link to development. Implementing this policy will not affect European sites.	
PC10: New Transport Schemes	This policy safeguards three transport scheme. These are referred to, but not proposed in the LDP. These schemes are identified in higher policy frameworks and can therefore be screened out of further assessment.	**Category C** **(Screened out)**
STR13: Natural and Built Environment, Green Networks and Infrastructure STR14: Climate Change and Environmental Protection EN2: Green Infrastructure EN5: Area of Outstanding Natural Beauty EN6: Sites of Biodiversity Importance EN7: Development Affecting Trees, Woodland and Hedgerows EN8: Built Historic Environment and Listed Buildings	These policies are designed to protect and enhance (where possible) the natural and cultural environment within Flintshire The implementation of these policies is considered to have no adverse impacts and potentially some beneficial effects on European sites.	**Category D** **(Screened out)**

EN9: Development in or Adjacent to Conservation Areas EN10: Buildings of Local Interest EN11: Green Barriers		
STR4: Principles of Sustainable Development, Design and Placemaking STR15: Waste Management STR16: Strategic Planning for Minerals EN4: Landscape Character EN12: New Development and Renewable and Low Carbon Energy Technology EN14: Flood Risk EN15: Water Resources EN18: Pollution and Nuisance EN19: Managing Waste Sustainably EN21: Locations for Waste Management Facilities	These policies are designed to steer change in such a way as to protect European sites from adverse effects. The implementation of these policies is considered to have no adverse impacts and potentially some beneficial effects on European sites.	**Category E** **(Screened out)**
PC3: Design HN2: Density and Mix of Development HN3: Affordable Housing	These policies set the criteria which new developments must adhere to in relation to the density and mix of housing (HN2), the proportion of affordable housing (HN3) and the design quality of new development (PC3). Implementing these policies will not affect European sites.	**Category F** **(Screened out)**
STR9: Retail Centres and Development PE9: Development Outside Primary Shopping Areas PE10: District and Local Centres PE11: Edge and Out of Town Retail Development	Policy STR9 seeks *to maintain and enhance the vibrancy, viability and attractiveness of Flintshire's town, district, and local centres, supporting the delivery of appropriate comparison and convenience retail, office, leisure, entertainment and cultural facilities*. Policies PE9, 10, 11 and 12 outline the areas where development within regional, district and local centres will be directed. These polices state that all new development within urban locations will be directed towards town centres and edge of existing settlement. There would be no likely significant effects of this type of development on European sites.	**Category H** (**Screened out)**
PE4: Farm Diversification	This policy supports farm diversification through development of existing farm complexes. Any such development would be *small-scale and specifically related to the farm operation or farm diversification scheme... In the case of new build, the buildings are of a scale, siting, design and materials appropriate to the site and surroundings. N*o likely significant effects of this type of development on European sites is anticipated.	
PE12: Tourist Accommodation, Facilities and Attractions	Although this policy could lead to development, any such development would be small-scale and within existing areas of settlement. No likely significant effects of this type of development on European sites is anticipated.	
PE14: Greenfield Valley	This policy relates to potential future development within Greenfield Valley *will be permitted where they do not detract from the tourism*	

	potential of the Valley or harm areas or features of landscape, nature conservation or historic value. Any future development at Greenfield Valley would be within the boundaries of the existing site, no likely significant effects of this type of development on European sites is anticipated.
HN4: Housing in the Countryside HN4-A: Replacement Dwellings HN4-B: Residential Conversion of Rural Buildings HN4-C: Infill Development in Groups of Houses HN4-D: Affordable Housing Exceptions Schemes	These polices relate to development within the countryside. Although these policies could lead to development, given the small-scale nature of any such potential developments (as determined by the criteria set out within the individual polices), no likely significant effects on European sites is anticipated.
EN16: Development on or near Landfill Sites or Derelict and Contaminated Land	This policy ensures that development is not permitted within or adjacent to landfill sites, or derelict sites where the potential for contamination exists. In relation to designated sites, the policy states that permission will only be granted if *measures can be taken to identify and safeguard any significant nature conservation and historic interest which exist on the site.* No likely significant effects of this type of development on European sites is anticipated.
STR3: Strategic Sites STR10: Tourism, Culture and Leisure HN1: New Housing Development Proposals HN8: Gypsy and Traveller Sites PE1: General Employment Land Allocations PE2: Principle Employment Areas PE8: Development within Primary Shopping Areas PC11: Mostyn Docks PC12: Community Facilities EN13: Renewable and Low Carbon Energy Development EN25: Sustainable Minerals Development	**Further screening required of these policies and associated allocations, refer to Tables 19 and 20.**

5 Detailed screening

5.1.1 The detailed screening of the LDP policies and allocation sites in relation to the European sites is presented in this section and is based on the findings of the initial screening exercise.

5.1.2 The detailed screening of the LDP policies and sites contains details of the potential impacts, the European sites potentially affected, and whether further Appropriate Assessment would be required. Each policy and site also include a categorisation of the potential effects in line with current guidance

(Tyldesley D. and Chapman, C (2013) The Habitats Regulations Assessment Handbook (accessed July 2019) edition UK DTA Publications Limited www.dtapublications.co.uk).

5.1.3 The allocations listed within the LDP are shown on the proposals map which accompanies the LDP.

5.2 Potential impacts

5.2.1 The following potential impacts have been identified through a review of the Conservation Objectives (and associated Supplementary Advice, where available), the management plans and policy guidance.

5.2.2 Note that none of the allocation sites within the LDP are located within a European site, and none of the policies would lead to development within a European site. Therefore, there would be no direct habitat or species loss of any European sites as a result of implementation of the LDP, and this potential impact pathway has been screened out of further assessment (alone and in combination).

Table 12: Potential impacts

Potential impact	European site
Air quality	Dee Estuary SAC/SPA/ Ramsar site Deeside and Buckley Newt SAC River Dee and Bala Lake SAC
Water quality	Dee Estuary SPA/ Ramsar site River Dee and Bala Lake SAC
Loss of habitat functionally linked to a European site	Dee Estuary SPA/ Ramsar site Deeside and Buckley Newt SAC
Disturbance/displacement	Dee Estuary SPA/ Ramsar site
Recreational disturbance	Dee Estuary SPA/ Ramsar site Deeside and Buckley Newt SAC

5.2.3 Each potential impact pathway is described in more detail below. The description includes an explanation as to why each of the potential impact pathways has been screened in or out of the further assessment. A review of available ecological information (as detailed below) has also been undertaken to inform the screening exercise to determine if a potential impact pathway could be present.

Ecological Information

5.2.4 The following data sources have been considered during the screening exercise to determine the presence of impact pathways to the European sites:

- Cofnod (North Wales Environmental Information Service) eMapper – to obtain details of protected species present in close proximity to the LDP allocations.
- British Trust for Ornithology (BTO) Bird Track Website – to obtain SPA/ Ramsar site species records in close proximity to the LDP allocations.
- Natural England pink-footed goose and swan functionally linked land Impact Risk Zone (IRZ) buffer – to identify areas of land outside of designated sites that have the potential to support habitats suitable for wintering geese and swans.
- OS mapping/MAGIC website – to identify the presence of water courses that could provide a link between an allocation and the designated sites.

Air quality

5.2.5 Changes in air quality from increased traffic and development could have impacts on European sites through an increase in nitrogen deposition which could occur as a result of the following:

- Construction activities in the vicinity of European sites.
- Increase in nitrogen deposition as a result of new employment sites.
- Increased population and road traffic may increase nitrogen deposition on sensitive habitats where these lie in close proximity to major commuting routes.

5.2.6 The Site Improvement Plan for the Dee Estuary and Mersey Narrows (Natural England, 2015) identified the risk of atmospheric nitrogen deposition as a potential pressure/threat to the European sites. The plan states that:

'*There are a variety of sources of air pollution including from the industrial areas adjacent [to] the Estuary. Nitrogen deposition exceeds the site-relevant critical loads*.'

5.2.7 The Site Improvement Plan includes the following qualifying features of the Dee Estuary which are sensitive to nitrogen deposition: estuaries, intertidal mudflats and sandflats, annual vegetation of drift lines, glasswort and other annuals colonising mud and sand, Atlantic salt meadows, shifting dunes, shifting dunes with marram, dune grassland, humid dune slacks and Petalwort. Production of a Site Nitrogen Action Plan is recommended although no details on how or when this would be actioned are provided.

5.2.8 Air quality has not been identified as a potential issue/ threat for the Deeside and Buckley Newt SAC (within the SAC Management Plan (NRW, 2008), or the River Dee and Bala Lake SAC (within the Prioritised Improvement Plan for the River Dee and Bala Lake (Natural England, 2014). Potential air quality impacts associated with these European sites have therefore been screened out of further assessment (alone and in combination).

Construction phase

5.2.9 In relation to construction activities near to the Dee Estuary, current air quality guidance suggests that any construction sites or routes used by construction vehicles within 50 m of a designated site[2]; and the presence of any European site within 200 m of the main access roads used by HGVs accessing the site[3] could lead to likely significant effects on the European site during the construction phases of new development.

5.2.10 Using aerial photography and Phase 1 habitat mapping from the Magic website[4], it is possible to determine that, of the qualifying features within the Site Improvement Plan sensitive to nitrogen deposition, there are no annual vegetation of drift lines, glasswort and other annuals colonising mud and sand, shifting dunes, shifting dunes with marram, dune grassland, humid dune slacks and Petalwort within 200 m of any of the allocation sites, or potential haul routes. These features can therefore be ruled out of potential impacts associated with air pollution and the construction phase of development. The remaining features (comprising estuaries, intertidal mudflats and sandflats, and Atlantic salt meadows) could be present within 200 m and are discussed further below.

A small number of allocation sites within the LDP are within 200 m of the Dee Estuary SAC/ Ramsar site/ site/ SPA, as shown in

[2] Institute of Air Quality Management (IAQM), Guidance on the assessment of dust from demolition and construction (2014)
[3] Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1, HA 207/07 – Air Quality, Highways Agency, 2007.
[4] MAGIC website. www.magic.gov.uk

5.2.11 Table 13.

Table 13: Allocation sites within 200 m of the Dee Estuary

Allocation	Construction site and haul route within 50 m of sensitive habitats/species?	Potential haul route used by HGVs within 200 m of sensitive habitat/ species?
Northern Gateway (Ref: STR3A and PE2.11)	Yes. The southern edge of the allocation lies directly adjacent to an area of intertidal mudflat and sandflat within the River Dee.	No. The main access routes into the site would be at the northern end of the allocation from the existing A494 (more than 200 m from the River Dee).
Greenfield Business Park Phase II (Ref: PE1.3 and PE2.15)	Yes. The western edge of the allocation lies directly adjacent to an area of saltmarsh and intertidal mudflat and sandflat.	Yes. The main access route for construction traffic into the Business Park would pass within 200 m of an area of saltmarsh and intertidal mudflat and sandflat, however, this would only be a short stretch (approximately 200 m) with the remainder of the access route onto the A548 more than 200 m away.
Greenfield Business Park Phase III (Ref: PE1.4 and PE2.15)	Yes. The north-eastern tip of the allocation site lies within 50 m of an area of saltmarsh and intertidal mudflat and sandflat. However, the vast majority of the site is more than 50 m away.	Yes. A short section of the main access route for construction traffic into the allocation would pass within 200 m of an area of saltmarsh and intertidal mudflat and sandflat, however, this would only be a stretch of approximately 200 m, with the remainder of the access route onto the A548 more than 200 m away.
Adjacent Mostyn Docks (Policy PC11 and Ref: PE1.8 and PE2.20)	Yes. The allocation lies directly adjacent to an area of an area of saltmarsh and intertidal mudflat and sandflat. However, the vast majority of the site is more than 50 m away.	Yes. The main access route into the site would be at the western end of the allocation from the existing A548. This route passes within 200 m of the Dee Estuary, but takes traffic away from the sensitive habitats.
Castle Park Solar Farm (Ref: EN13.2)	No. The very northwest corner of the site lies within 50 m of the Estuary; however, the remainder of the site is more than 50m away.	Yes. The main access route into the site would be through Ashmount Industrial Estate. This route would pass within 200m of an area of saltmarsh and intertidal mudflat and sandflat. However, this would only be a short stretch with the remainder of the access route onto the A548 more than 200 m away.
Crumps Yard Solar Farm (Ref: EN13.1)	No. The allocation lies 80 m from the River Dee.	Yes. The main access route into the site would be along Dock Road. This route passes adjacent to the River Dee for a short section, then takes traffic away from any sensitive habitats.

Allocation	Construction site and haul route within 50 m of sensitive habitats/species?	Potential haul route used by HGVs within 200 m of sensitive habitat/ species?
Ashmount Industrial Estate, Bagillt (Ref: PE2.13)	Yes. The allocation lies directly adjacent to an area of an area of saltmarsh and intertidal mudflat and sandflat. However, the vast majority of the site is more than 50 m away.	Yes. The main access route into the site would be through the existing Ashmount Industrial Estate. This route would pass within 200m of an area of saltmarsh and intertidal mudflat and sandflat. However, this would only be a short stretch with the remainder of the access route onto the B5129 more than 200 m away.
Dock Road, Connah's Quay (Ref: PE2.10)	Yes. The north-eastern tip and the western edge of the allocation site lies within 50 m of an area of saltmarsh and intertidal mudflat and sandflat. However, the vast majority of the site is more than 50 m away.	Yes. The main access route into the site would be along Dock Road. This route passes adjacent to the River Dee for a short section, then takes traffic away from any sensitive habitats.
Queensferry Industrial Estate, Pentre (Ref: PE2.22)	Yes. The allocation lies directly adjacent to an area of an area of saltmarsh and intertidal mudflat and sandflat. However, the vast majority of the site is more than 50 m away	No. The main access routes into the site would be at the northern end of the allocation from the existing B5129 (more than 200 m from the River Dee).
Engineer Park and St Ives Park, Sandycroft (Ref: PE2.27)	Yes. The allocation lies directly adjacent to an area of an area of saltmarsh and intertidal mudflat and sandflat. However, the vast majority of the site is more than 50 m away	No. The main access routes into the site would be at the northern end of the allocation from the existing B5129 (more than 200 m from the River Dee).
Sandycroft Industrial Estate, Sandycroft (Ref: PE2.29)	Yes. The allocation lies directly adjacent to an area of an area of saltmarsh and intertidal mudflat and sandflat. However, the vast majority of the site is more than 50 m away	No. The main access routes into the site would be at the northern end of the allocation from the existing B5129 (more than 200 m from the River Dee).
The Borders Industrial Park, Chesterbank Industrial Park and Brymau Four Estate, Saltney (Ref: PE2.26)	Yes. The allocation lies directly adjacent to an area of an area of saltmarsh and intertidal mudflat and sandflat. However, the vast majority of the site is more than 50 m away	Yes. The main access route into the site would be along the existing B5129. This route passes adjacent to the River Dee for a short section, then takes traffic away from any sensitive habitats.
Brymau One, Two and Three Estates and Glen Industrial Estate, Saltney (Ref: PE2.25)	Yes. The allocation lies directly adjacent to an area of an area of saltmarsh and intertidal mudflat and sandflat. However, the vast majority of the site is more than 50 m away	Yes. The main access route into the site would be along the existing B5129. This route passes adjacent to the River Dee for a short section, then takes traffic away from any sensitive habitats.

Based on the information provided in

5.2.12 Table 13, sensitive habitats are present within 200 m of potential construction sites or potential haul routes for all of the allocation sites near to the Dee Estuary. However, the Appropriate Assessment of the Masterplan for the Northern Gateway (Ref: STR3A and PE2.11) allocation did not identify likely significant effects associated air pollution (Middlemarch Environmental, 2010 (Appendix D2)). Policy PC11 in relation to the Mostyn Docks allocation within the LDP states that '*Development proposals which enhance the transport and employment role of the docks will be permitted provided that such proposals do not have a significant adverse effect on the ecological, landscape, historic, recreational integrity and water and air quality of the Dee Estuary'.* For the remaining eleven sites in Table 13, these are all small (less than 20 ha in total), development/redevelopment allocations within existing industrial areas. Whilst there is the potential for an increase air pollution as a result of an increase in HGVs during any construction activities at the allocations, given the small-scale of any such redevelopment, and the expected short-term duration of construction activities at these allocation sites, it is not anticipated that any future development/redevelopment at these sites would be sufficient to cause a likely significant effect on the adjacent sensitive habitats/species either alone or in combination.

5.2.13 Although allocation Castle Park Industrial Estate (Ref: HN8.4) lies adjacent to the Dee Estuary SPA/ Ramsar site/ SAC, given that there would be no construction works associated with allocating the site as a gypsy and traveller site, no likely significant effects on the air quality on the adjacent SPA/ Ramsar site/SAC are anticipated (and this allocation has not been included in Table 13 above).

5.2.14 In addition, to protect air quality, all new developments would be required produce a Construction Environmental Management Plan, which ensures any environmental impacts are avoided or minimised during construction. This would be in addition to according with relevant legislation ensuring any emissions meet appropriate guidelines. Given that no developments would be consented if they do not meet the stringent air quality guidance, this potential impact pathway has been **screened out** of further assessment.

Operational phase

Employment sites

5.2.15 In relation to operational phase impacts associated with new development within Flintshire, the Council can confirm that all employment site allocations within the LDP are allocated for B Use Classes. This includes Use Class B1, B2 and B8 only. B use classes are defined as follows: B1-business (comprising offices, premises for Research and Development and light Industrial processes which can take place within a residential area without damaging the amenity of that area); B2 - general Industry (for the use of carrying out an industrial process other than one falling within class B1); and B8 - storage and distribution (applies to properties and land which are used for storage or as a distribution centre).

5.2.16 Although it is not possible, at this strategic level, to confirm exactly which businesses would be developed on the employment allocations within the LDP, given that the B1, B2 and B8 use classes do not include the types of businesses which are likely to cause significant increases in air pollution, any increase in industrial air pollution as a result of new B Class employment sites within Flintshire would be negligible, and not significant.

5.2.17 In addition, any new developments would be required to accord with relevant legislation ensuring any emissions meet appropriate guidelines and comply with all relevant policies within the LDP before they can be consented. Therefore, any potential impacts associated with air pollution from new employment allocations are considered unlikely. This potential impact pathway has been **screened out** of further assessment.

Housing Developments

5.2.18 The construction of approximately 7,950 new homes within Flintshire has the potential to increase traffic (and as a consequence air pollution) within the new housing estates themselves, as well as along existing roads used by new homeowners (such as commuter routes) in the vicinity of sensitive habitats/species. IAQM/ EPUK and DMRB guidance consider designated sites that falls within 200 m of a new road/development when undertaking air quality assessments.

5.2.19 In terms of new housing developments themselves, only one housing allocation within the LDP is located within 200m of any sensitive habitats/species associated with European sites. The southern edge of the allocation lies directly adjacent to an area of intertidal mudflat and sandflat within the Dee Estuary SAC. However, the Appropriate Assessment for the Northern Gateway Masterplan (Middlemarch Environmental, 2010 (Appendix D2)), did not identify any potentially significant air quality effects. Significant effects on the sensitive habitats and species within the Dee Estuary (or any other European sites), as a result of increases in traffic associated with the new housing developments allocated within the LDP, are therefore considered unlikely. This potential impact pathway has been **screened out** of further assessment.

Conclusion

5.2.20 No air quality impacts have been identified as a result of implementing the LDP alone. Any potential residual air quality effects are considered to be de minimis (i.e. the risk of the LDP contributing to a likely significant effect, in combination with other plans/ projects, is hypothetical rather than conceivable). Consequently, no in combination effects in terms of air pollution are anticipated (as per the Wealden District Council v. Secretary of State for Communities and Local Government, Lewes District Council and South Downs National Park Authority [2017] EWHC 351). Potential air quality effects have been **screened out** of further assessment alone and in combination.

Water quality

5.2.21 Changes in water quality as a result of new development could have impacts on European sites as a result of the following:

- Increased risk of potential pollution incidents from construction activities in the vicinity of European sites.
- Potential increases in suspended sediments resulting in ecological effects, such as the direct loss of habitats caused by re-deposition of suspended sediment, and the consequential health or mortality effects on prey species, particularly invertebrates associated with the intertidal mudflats.

5.2.22 The Site Improvement Plan for the Dee Estuary and Mersey Narrows (Natural England, 2015) identified water pollution as a potential pressure/threat to the European sites. The plan states that:

'*The Dee Estuary may be nutrient enriched (there are currently failures for dissolved inorganic nitrogen and macro algae) and is affected by both diffuse and point sources. The Lower River Dee may also be nutrient enriched, with high phosphate levels and possibly elevated nitrate levels (associated with agricultural sources). There are a number of outfalls (stormwater and industrial overflows) within the vicinity of this site which could have an impact on the site. Industrial sites (including historic sites) surrounding the Estuary pose a risk of diffuse and point source pollution. There is also a risk from unregulated activity which is not fully understood. Moreover, historic waste sites including former collieries, landfills etc are releasing leachate and waste and require action to prevent further pollution. Some of the extent/severity of impacts require further quantification*.'

5.2.23 A small number of allocation sites within the LDP are potentially hydrologically linked to the River Dee and Bala Lake SAC or the Dee Estuary Ramsar/SPA/SAC, as shown in Table 14. There are no allocation sites hydrologically linked to the Deeside and Buckley Newt Sites SAC.

Table 14: Allocation sites near to a European site with potential hydrological link

Allocation	Allocation site hydrologically linked
Northern Gateway (Ref: STR3A and PE2.11)	Although there are no watercourses within the allocation which could link into a European site, the allocation site is located directly adjacent the River Dee, and therefore there is the potential for construction site run off.
Ashmount Industrial Estate, Bagillt (Ref: PE2.13)	
Dock Road, Connah's Quay	

Allocation	Allocation site hydrologically linked
(Ref: PE2.10)	
Queensferry Industrial Estate, Pentre (Ref: PE2.22)	
Engineer Park and St Ives Park, Sandycroft (Ref: PE2.27)	
Sandycroft Industrial Estate, Sandycroft (Ref: PE2.29)	
The Borders Industrial Park, Chesterbank Industrial Park and Brymau Four Estate, Saltney (Ref: PE2.26)	
Brymau One, Two and Three Estates and Glen Industrial Estate, Saltney (Ref: PE2.25)	
Greenfield Business Park Phase II (Ref: PE1.4 and PE2.15)	Although there are no watercourses within these allocations which could link into a European site, the allocations lie adjacent to areas of saltmarsh and intertidal mudflat and sandflat within the Dee Estuary, and therefore there is the potential for construction site run off.
Greenfield Business Park Phase III (Ref: PE1.5 and PE2.15)	
Adjacent Mostyn Docks (Policy PC11 and Ref: PE1.8 and PE2.20)	
River Lane, Saltney (Ref: PE1.11)	Although there are no watercourses within this allocation which could link into a European site, the allocation lies adjacent to River Dee and Bala Lake SAC, and therefore there is the potential for construction site run off.
Castle Park Solar Farm (Ref: EN13.2)	Although there are no watercourses within this allocation which could link into a European site, the allocation lies adjacent to the Dee Estuary and drainage ditches (within Flint Marsh) flow into the Estuary, and therefore there is the potential for construction site run off.

5.2.24 Five other allocations lie in the vicinity of the Dees Estuary, or could be hydrologically linked, however, potentially significant effects are considered unlikely, as detailed below.

5.2.25 Although Crump's Yard Solar Farm (Ref: EN13.1) is located within 80 m of the Dee Estuary, there are no apparent direct, or indirect hydrological links to the nearby designated sites, and therefore likely significant water quality effects have been ruled out. Land between Denbigh Road and Gwernaffield Rd, Mold (Ref: HN1.6) lies adjacent to the River Alyn which discharges into the River Dee and Greenfield Cemetery (Ref: PC12.2) is adjacent to a small unnamed watercourse which flows into the Dee Estuary. However, due to the distances involved for both allocation sites, any pollutants entering the watercourses as a result of development, would need to travel a significant distance before discharging into a designated watercourse, and therefore would be diluted such that there would be no likely significant effect. Castle Park Industrial Estate (Ref: HN8.4) lies adjacent to the Dee Estuary

and Riverside, Queensferry (Extension) (Ref: HN8.3) is within 100 m of the Dee Estuary. Given that there would be no construction works associated with allocating these two sites as a gypsy and traveller sites, no likely significant effects on the water quality of the adjacent SPA/ Ramsar site/SAC are anticipated. Potential water quality effects associated with these three sites has been **screened out** of further assessment.

Conclusion

5.2.26 There are a small number of allocations with the potential for impacts on water quality as a result of future development at these sites. This potential impact has therefore been **screened in** for further assessment for those thirteen allocations set out within Table 14.

Loss of habitat functionally linked to a European site (i.e. used by overwintering/ passage birds or great crested newts)

5.2.27 Functionally linked land is considered to be any land outside of a European site, which is regularly used by species that are a qualifying interest features of that European site. When assessing use of land by SPA/ Ramsar site bird species, such areas would be considered functionally linked only where significant numbers of qualifying species are regularly present.

5.2.28 In relation to this HRA Report, this includes land (comprising farmland, or other wetland habitat and brown field sites) that is regularly used by qualifying bird species associated with the Dee Estuary SPA/ Ramsar site during the winter and on passage for foraging or roosting, such as godwits, oystercatcher and curlew. The Site Improvement Plan for the Dee Estuary and Mersey Narrows does not include loss of functionally linked land as a potential threat to the European sites. However, there are a number of allocation sites located within, or adjacent to land which could potentially constitute functionally linked land for SPA/ Ramsar site bird species.

5.2.29 Functionally linked land also applies to terrestrial habitat suitable for great crested newts associated with the Deeside and Buckley Newt Sites SAC. Flintshire County Council have produced a Great Crested Newt Mitigation Requirements Supplementary Planning Guidance note (Flintshire County Council, 2018) to provide advice and guidance to developers, landowners, members and other council officers when making decisions on planning issues involving, or in close proximity to great crested newt populations. A small number of the allocation sites are located within, or adjacent to the Deeside and Buckley Newt Sites SAC.

SPA/ Ramsar site qualifying bird species

5.2.30 Loss of functionally linked land would only be related to those qualifying species which are known to regularly use habitats outside of the European sites for foraging or roosting. Guidance produced by Natural England (provided in Appendix C) indicates the distance from the designated sites over which different species would generally disperse to forage/ roost. For the qualifying wintering waders and wildfowl associated with the Dee Estuary SPA/ Ramsar site (which could utilise functionally linked land including species such as curlew, oystercatcher and shelduck) the maximum distance these species would generally travel away from the European sites would be 2 km. Species that travel further are not listed as individual qualifying species on the site citations, and the extent of the Natural England goose and swan functional land IRZ is also located over 2.5 km from any of the LDP allocations.

5.2.31 Although there are 19 allocations within 2.5 km of the Dee Estuary, none are considered to be located on functionally linked land, as detailed in Table 15. Loss of functionally linked land in relation to SPA/ Ramsar site birds is therefore **screened out** of further assessment alone and in combination.

Table 15: Allocations within 2.5 km of the Dee Estuary SPA/ Ramsar site

Allocation	Description
Northern Gateway (Ref: STR3A and PE2.11)	The Northern Gateway allocation does support large fields which could be used by SPA/ Ramsar site species; however, the Environmental Statement of the Masterplan (Middlemarch Environmental, 2010) confirms that this area does not constitute functionally linked land (‘*the application site possesses no*

Allocation	Description
	important high tide wetland bird roosts. In addition, no significant wetland bird roosts were identified adjacent to, or abutting the application site'.)
Chester Road East, Queensferry (Ref: PE1.9)	Although this green field site is located within 2 km of the Estuary, it comprises scrub and rough grassland in an urban location. The site is surrounded on all sides by existing development and roads, and a railway, and no bird records of wintering waterfowl were identified within or close to the allocation. The site is not considered to constitute functionally linked land.
Rowley's Drive, Shotton (Ref: PE1.12 and PE2.30)	Very small allocation comprising scrub and trees. The site is surrounded on all sides by existing development and is unsuitable for SPA/ Ramsar site species. The site would not constitute functionally linked land.
Highmere Drive, Connah's Quay (Ref: HN1.3)	Two green field allocations on the edge of Connah's Quay. The sites are adjacent to development, and no bird records of wintering waterfowl were identified within or close to the allocations. These sites would not be considered to constitute functionally linked land.
Broad Oak Holding, Mold Road, Connah's Quay (Ref: HN1.2)	
Northop Road, Flint (Ref: HN1.4)	Although this green field site is located within 1.5 km of the Estuary, it is enclosed by existing development and roads to the north, east and west, and woodland and a golf course to the south. No bird records of wintering waterfowl were identified within or close to the allocation. The site is not considered to constitute functionally linked land.
Greenfield Business Park Phase II (Ref: PE1.4 and PE2.15)	Although this allocation lies adjacent to the Dee Estuary, the site comprises rough grassland, hard standing and scrub. The site appears to be well used by vehicles and is not considered to constitute functionally linked land.
Greenfield Business Park Phase III (Ref: PE1.5 and PE2.15)	Although the two compartments which make up this allocation lie adjacent to the Dee Estuary, the sites comprise predominantly scrub with small sections of grassland and hard standing. The site is unsuitable for SPA/ Ramsar site species and is not considered to constitute functionally linked land.
Adjacent Mostyn Docks (Ref: PE1.8 and PE2.20)	Although this allocation site lies adjacent to the Dee Estuary, the site comprises predominantly scrub with small sections of grassland and hard standing. The site is unsuitable for SPA/ Ramsar site species and is not considered to constitute functionally linked land.
Greenfield Cemetery (Ref: PC12.2)	The allocation comprises areas of scrub/woodland to the west and a small grassland field (split into two on the eastern side of the site). The allocation is surrounded by existing development and woodland and is not considered to constitute functionally linked land.
Castle Park Solar Farm (Ref: EN13.2)	Although this allocation lies adjacent to the Dee Estuary, the site comprises rough grassland and scrub. The site appears to be well used, with paths crossing the allocation on the northern side. The site is not considered to constitute functionally linked land.
Crumps Yard Solar Farm (Ref: EN13.1)	The allocation comprises predominantly scrub with small sections of grassland and hard standing. The site is surrounded by existing development/railway line and appears to be well used by local residents with numerous paths leading from existing development to the north. The site is not considered to constitute functionally linked land.

Allocation	Description
Magazine Lane, Ewloe (Extension) (Ref: HN8.1)	The site comprises a single small field surrounded by trees and is not considered to constitute functionally linked land.
Riverside, Queensferry (Extension) (Ref: HN8.3)	Although less than 100 m from the Dee Estuary, the site comprises hardstanding and scrub and is not considered to constitute functionally linked land.
Castle Park Industrial Estate (Ref: HN8.4)	Although the sites are adjacent to the Dee Estuary, the sites comprise small areas of hardstanding and are not considered to constitute functionally linked land.
Ashmount Industrial Estate, Bagillt (Ref: PE2.13)	
Dock Road, Connah's Quay (Ref: PE2.10)	
Manor Industrial Estate, Bagillt (Ref: PE2.3)	
Castle Park/ Ashmount Industrial Centre, Flint (Ref: PE2.14)	

Great crested newts

5.2.32 Flintshire's Great Crested Newt Mitigation Requirements Supplementary Planning Guidance (SPG) (Flintshire, 2018) indicates that functionally linked land could occur up to 500 m from the SAC boundary (refer to Appendix I of the SPG). The Conservation Objectives for the Deeside and Buckley Newt Sites SAC also includes the following:

"Off site habitats that function as stepping stones or corridors located between SAC compartments will be maintained for migration, dispersal, foraging and genetic exchange purposes"

5.2.33 None of the allocation sites are located within the SAC, and therefore no habitat within the SAC will be directly affected. In addition, none of the allocations lie between compartments that make up the SAC and therefore any such links would not be affected by the allocations within the LDP. The only potential impact could be through allocations which lie within the 500m buffer set out within the Great Crested Newt Mitigation Requirements Supplementary Planning Guidance. However, although there are nine allocations within 500m of the SAC boundary, none are considered to be functionally linked to the SAC populations of great crested newts (as detailed in Table 16), and this potential impact has therefore been **screened out** of further assessment alone and in combination.

Table 16: Allocations adjacent to SAC compartments

Allocation	Proximity to SAC
Drury New Road, Buckley (Ref: PE1.3)	The site is directly adjacent to the SAC on its northern and western boundaries. The main aggregation of ponds within the SAC compartment are approximately 400 m away. There does not appear to be any ponds within the allocation site itself. There are no NBN, or COFNOD records for the site, with the nearest records being 50 m to the north within the SAC.

Allocation	Proximity to SAC
	The site itself is not considered optimal newt habitat and is not considered to be functionally linked to the SAC.
Broad Oak Holding, Mold Road, Connah's Quay, Flintshire (Ref: HN1.2)	The site is approximately 15 m from the SAC at its closest point. The SAC is separated by a road, and the ponds within the compartment are more than 200 m from the allocation (separated by housing and a main road). There are no NBN, or COFNOD records for the site, but there is a pond to the north and NBN record to the north of the allocation. The site itself is not considered optimal newt habitat and is not considered to be functionally linked to the SAC.
Magazine Lane, Ewloe (Extension) (Ref: HN8.1)	The site is approximately 410 m from the SAC at its closest point. The SAC is separated by the A55, and the ponds within the compartment are more than 500 m from the allocation (separated by the A55, woodland and the quarry). There are no NBN, or COFNOD records for the site. The site itself is not considered optimal newt habitat and is not considered to be functionally linked to the SAC.
Extension to Pant y Pwll Dwr Quarry (Limestone) (Ref: EN25.2)	The site is adjacent to the SAC but separated from the quarry by existing roads. There are no NBN or COFNOD records for the site, but there are NBN records to the north (approximately 300m) and east (approximately 500m). The site itself is not considered optimal newt habitat (due to the existing quarry works) and is not considered to be functionally linked to the SAC.
Ewole Barns (Industrial Estate), Alltami (Ref: PE2.1)	The site is directly adjacent to the SAC on its southern boundary. The nearest pond within the SAC compartment is approximately 400 m away. There do not appear to be any ponds within the allocation site itself. There are no NBN, or COFNOD records for the site. The site itself is not considered optimal newt habitat and is not considered to be functionally linked to the SAC.
Alltami Depot, Alltami (Ref:PE2.2)	The site is adjacent to the SAC but separated by existing roads. There are no NBN or COFNOD records for the site. The site itself is not considered optimal newt habitat and is not considered to be functionally linked to the SAC.
Catheralls Industrial Estate and Pinfold Industrial Estate, Buckley (Ref: PE2.5)	The site is directly adjacent to the SAC on its northern boundary. The nearest pond within the SAC compartment is approximately 160m away. There do not appear to be any ponds within the allocation site itself. There are no NBN, or COFNOD records for the site. The site itself is not considered optimal newt habitat and is not considered to be functionally linked to the SAC.
Little Mountain Industrial Estate, Buckley (Ref: PE2.7)	The site is directly adjacent to the SAC on its northern boundary. The nearest pond within the SAC compartment is approximately 400m away. There do not appear to be any ponds within the allocation site itself. There are no NBN, or COFNOD records for the site.

Allocation	Proximity to SAC
	The site itself is not considered optimal newt habitat and is not considered to be functionally linked to the SAC.
Spencer Industrial Estate, Buckley (Ref: PE2.8)	The site is directly adjacent to the SAC on its northern and western boundaries. The nearest pond within the SAC compartment is approximately 300m away. There do not appear to be any ponds within the allocation site itself. There are no NBN, or COFNOD records for the site. The site itself is not considered optimal newt habitat and is not considered to be functionally linked to the SAC.

Conclusion

5.2.34 There would be no loss of functionally linked land associated with the Dee Estuary SPA/ Ramsar site or the Deeside and Buckley Newt Sites SAC as a result of implementing the LDP, and therefore this impact has been **screened out** of further assessment alone and in combination.

Disturbance/ displacement to species as a result of construction activities/ operational stage

5.2.35 There is the potential to disturb qualifying species within European sites, in particular birds, during the construction and operational phases of new developments. Disturbance/displacement could occur as a result of noise, visual, vibration and lighting disturbance during both the construction and operational phase of new developments. This could be associated with development near to the Dee Estuary itself, or disturbance/ displacement of bird using functionally linked land adjacent to new development sites.

5.2.36 There are nine allocations (comprising: Greenfield Business Park Phase II (Ref: PE1.4 and PE2.15), Greenfield Business Park Phase III (Ref: PE1.5 and PE2.15), Adjacent Mostyn Docks (Policy PC11 and Ref: PE1.8 and PE2.20), Castle Park Solar Farm (Ref: EN13.2), Castle Park Industrial Estate (Ref: HN8.4), Ashmount Industrial Estate, Bagilly (Ref: PE2.13), Dock Road Connah's Quay (Ref: PE2.10), Manor Industrial Estate, Bagillt (Ref: PE2.3) and Castle Park/ Ashmount Industrial Centre, Flint (Ref: PE2.14) directly adjacent to the Dees Estuary SPA/ Ramsar site with the potential to disturb birds within the estuary itself. Further assessment will be required of these allocations and they are **screened in** for further assessment.

5.2.37 For the remaining nine allocations within 2.5 km of the Dee Estuary (i.e. within the likely foraging range of Dee Estuary SPA/ Ramsar site species as set out within paragraph 5.2.30), none were considered to be adjacent to land which could constitute functionally linked land (as set out within Table 17) and can therefore be **screened out** of further assessment alone and in combination.

Table 17: Allocations within 2.5 km of the Dee Estuary SPA/ Ramsar site

Allocation	Description
Northern Gateway (Ref: STR3A and PE2.11)	The allocation is surrounded by development and roads, there is no functionally linked land adjacent to the allocation.
Chester Road East, Queensferry (Ref: PE1.9)	This allocation is surrounded on all sides by existing development and roads, and a railway. There is no functionally linked land adjacent to the allocation.
Rowley's Drive, Shotton (Ref: PE1.12 and PE2.30)	This allocation is surrounded on all sides by existing development and roads, and a railway. There is no functionally linked land adjacent to the allocation.
Highmere Drive, Connah's Quay (Ref: HN1.3)	This allocation is surrounded by existing development to the north and east. Although there are fields to the south and west, these are small and surrounded by woodland

Allocation	Description
	and scrub and farm buildings. These fields would not be considered to be functionally linked land adjacent to the allocation.
Broad Oak Holding, Mold Road, Connah's Quay (Ref: HN1.2)	This allocation is surrounded by existing development to the north and south. Although there are fields to the west, these are small and surrounded by woodland and scrub. These fields would not be considered to be functionally linked land adjacent to the allocation.
Northop Road, Flint (Ref: HN1.4)	This allocation is enclosed by existing development and roads to the north, east and west. Although there are a number of smaller fields to the south, these are surrounded by woodland, roads and a golf course. The site is not considered to be adjacent to functionally linked land.
Crumps Yard Solar Farm (Ref:EN13.1)	This allocation is surrounded by existing development to the north, west, and south. Although there is some rough grassland to the east, this is surrounded by scrub and trees, and is adjacent to existing development. The site is not considered to be adjacent to functionally linked land.
Riverside, Queensferry (Extension) (Ref: HN8.3)	This allocation is surrounded by existing development. The site is not considered to be adjacent to functionally linked land.
Greenfield Cemetery (Ref: PC12.2)	The allocation is surrounded by existing development and woodland. The fields to the south comprise grassland, however, they are small and surrounded by hedgerows and trees reducing potential sightlines. The land surrounding the allocation is not considered to constitute functionally linked land.

Conclusion

5.2.38 There are nine allocations located directly adjacent to the Dee Estuary with the potential for disturbance/ displacement impacts on the Dee Estuary SPA/ Ramsar site itself, as a result of future development at these sites. This potential impact has therefore been **screened in** for further assessment for those nine allocations. None of the allocations within 2.5 km of the Dee Estuary SPA/ Ramsar site were considered to be located near to habitats which could be considered functionally linked land to the European site, and therefore this potential impact has been **screened out** of further assessment alone and in combination.

Disturbance to habitats and species through increased recreational activity, during operational stage

5.2.39 There is the potential to disturb and/or displace qualifying species associated with European sites, in particular birds, during the construction and operational phases of new developments in proximity to the site's boundary. Recreational disturbance/displacement could occur as a result of the following:

- Increase in use of footpaths across land which is considered to be functionally linked land as a result of new housing developments.
- Increase in recreational disturbance to birds as a result of an increase in visitors to the coast.
- Increase in disturbance on great crested newts as a result of increased visitors to parks and nature reserves forming part of the Deeside and Buckley Newt SAC
- Increase in recreational pressure on the Dee Estuary SAC leading to degradation of habitats within the SAC.

SPA/ Ramsar site qualifying bird species

5.2.40 The Site Improvement Plan for the Dee Estuary identified public access/disturbance as a potential pressure/threat to the site. The plan states that:

'Direct disturbance to birds as a result of public access and recreation activities (including dog walking, kite surfing, sand yachting, parascending, hovercrafts etc) is a concern.'

5.2.41 The Regulation 33 advice for the Dee Estuary identifies areas where recreational activities are prevalent and in close proximity to roosting and breeding sites used by qualifying bird species. The locations identified in the Regulation 33 advice as those subject to moderate levels of recreational activity are all to the north of Flint.

5.2.42 An increase in population (as a result of new development) could result in increased recreational pressure as a result of additional people in an area and the consequent increases in people visiting the Dee Estuary. In order to assess the potential impact, the distance people regularly travel to visit coastal areas has been reviewed. A Recreational Disturbance Study carried out by Footprint Ecology for the Morecambe Bay Partnership identified that visitors to the Morecambe Bay coast who were on a day-trip/short visit from home travelled a median distance of 3.454 km to get to the European site. The Dee Estuary is within close proximity for residents of Flintshire and therefore, increased disturbance to birds (as a result of recreational pressure) at this European site could occur, particularly for those allocations within 3.5 km of the European site. New housing allocation sites (excluding new gypsy and travellers sites allocated under policy HN8) and mixed-use allocations (which include an element of residential dwellings within the proposals) within 3.5 km of a European site and employment sites within 1.5 km of the Dee Estuary will therefore be **screened in** for further assessment.

5.2.43 There is also the potential for increased recreational use of land outside of the European site, but which is functionally linked to the European site, as a result of new housing developments within Flintshire. The presence of functionally linked land adjacent to allocations within 2.5 km of the Dee Estuary SPA/ Ramsar site has been **screened out** of the assessment (refer to Paragraphs 5.2.33 and 5.2.36) and therefore potential recreational pressure on such land can also be **screened out** of further assessment alone and in combination.

Great crested newts

5.2.44 The management plan for the Dee and Buckley Newt SAC acknowledges the regular recreational use of a number of the compartments that form the SAC. There are three allocations in close proximity of the SAC (comprising Broad Oak Holding, Mold Rd (Ref: HN1.2), Holywell Road/ Green Lane, Ewloe (Ref: HN1.7) and Drury New Road (Ref: PE1.4) which could be accessed by new residents/ employees. This potential impact has therefore been **screened in** for further assessment in relation to these three allocation sites.

Conclusion

5.2.45 There are a number of allocations with the potential for recreational impacts on the Dee Estuary SPA/ Ramsar site, and the Dee and Buckley Newt SAC. This potential impact has therefore been **screened in** for further assessment.

5.3 Detailed Screening of the LDP Policies

5.3.1 The screened in LDP policies/allocation sites were examined in detail to determine the need for further Appropriate Assessment.

5.3.2 Table 18 provides the screening of the policies. The detailed assessment of each of the allocation sites associated with these policies is provided in Table 19. Based on the initial screening exercise, the following potential impacts have been screened in/ out of the detailed screening.

5.3.3 The following potential impacts have been screened in/ out of the detailed screening.

Table 18: Potential Impacts Screened in/out of the Assessment

Potential impact	European site	Screened in/ out of assessment alone?	Screened in/ out of assessment in combination
Air quality	Dee Estuary SPA/ Ramsar site	Screened out	Screened out
Water quality	Dee Estuary SPA/ Ramsar site River Dee and Bala Lake SAC	**Screened in**	**Screened in**
Loss of habitat functionally linked to a European site	Dee Estuary SPA/ Ramsar site Deeside and Buckley Newt SAC	Screened out	Screened out
Disturbance/displacement	Dee Estuary SPA/ Ramsar site Deeside and Buckley Newt SAC	**Screened in**	**Screened in**
Recreational disturbance	Dee Estuary SPA/ Ramsar site Deeside and Buckley Newt SAC	**Screened in**	**Screened in**

Table 19: Detailed Screening of the Screened In Policies within the LDP

Policy	European site Potentially Affected	Potential Effects	Detailed Assessment	Conclusion
STR3: Strategic Sites	Dee Estuary SPA/ Ramsar site Deeside and Buckley Newt SAC	This policy details the two key strategic sites (Northern Gateway and Warren Hill) which will make an important contribution to the overall provision for growth in Flintshire over the Plan period New development at these strategic sites has the potential to impact European sites through changes to water quality, disturbance/ displacement of SPA/ Ramsar site species and recreational pressure.	Detailed screening of the two strategic sites associated with this policy is provided in Table 20. Extensive project-level assessment has been undertaken at both of these strategic sites. The detailed screening confirmed no LSE on the European sites considered in this assessment, and no further assessment of these allocations alone or in combination is required.	**No LSE alone or in combination**
STR10: Tourism, Culture and Leisure	Dee Estuary SPA/ Ramsar site Deeside and Buckley Newt SAC	This policy details how Flintshire can capitalise on its attractiveness as a tourist destination. There are no allocation sites associated with this policy, however, the policy has the potential to lead to development of new recreational areas which could increase recreational pressure on European sites.	The policy includes wording which would aim to protect European sites. The policy states that: *All proposed development must be appropriate to its location and surrounding environment and not have negative landscape or environmental impact with particular regard to the Clwydian Range Area of Outstanding Natural Beauty (AONB) and European Designated Sites'* This along with compliance with Policy STR13 (which protects the natural environment), would ensure no LSE associated with future tourism and leisure developments within Flintshire.	**No LSE alone or in combination**
HN1: New Housing Development Proposals	Dee Estuary SPA/ Ramsar site/ SAC Deeside and Buckley Newt SAC River Dee and Bala Lake SAC	This policy sets out the locations to help deliver the identified housing requirement over the Plan period. New residential development has the potential to impact European sites through changes to water quality, disturbance/ displacement of SPA/ Ramsar site species and recreational pressure.	Detailed screening of the new housing allocations associated with this policy is provided in Table 20. The detailed screening confirmed no LSE on the European sites considered in this assessment and no further assessment of these allocations alone is required. Further in combination assessment was required for the six housing allocations within 3.5 km of the Dee Estuary. The assessment (refer to Sections 6 and 7) concluded no likely significant in combination effects.	**No LSE alone or in combination**
HN8: Gypsy and Travellers Sites	Dee Estuary SPA/ Ramsar site/ SAC Deeside and Buckley Newt SAC River Dee and Bala Lake SAC	This policy sets out the locations for four gypsy and travellers sites. These allocations have the potential to impact European sites through changes to water quality, disturbance/ displacement of SPA/ Ramsar site species and recreational pressure.	Detailed screening of the gypsy and travellers site allocations associated with this policy is provided in Table 20. The detailed screening confirmed no LSE on the European sites considered in this assessment and no further assessment of these allocations alone is required. The detailed screening confirmed no LSE on the European sites considered in this assessment and no further assessment of these allocations alone or in combination is required.	**No LSE alone or in combination**
PE1: General Employment Land Allocations	Dee Estuary SPA/ Ramsar site Deeside and Buckley Newt SAC River Dee and Bala Lake SAC	This policy sets out the general employment land which has been allocated for B1, B2 and B8 employment uses over the Plan period. New employment development has the potential to impact European sites through changes to water quality, disturbance/ displacement of SPA/ Ramsar site species and recreational pressure.	Detailed screening of the new employment allocations associated with this policy is provided in Table 20. The detailed screening confirmed no LSE on the European sites considered in this assessment and no further assessment of these allocations alone or in combination is required.	**No LSE alone or in combination**
PE2: Principal Employment Areas	Dee Estuary SPA/ Ramsar site Deeside and Buckley Newt SAC River Dee and Bala Lake SAC	This policy sets out the areas where most employment development is likely to take place. New employment development has the potential to impact European sites through changes to water quality, disturbance/ displacement of SPA/ Ramsar site species and recreational pressure.	Detailed screening of the principal employment areas associated with this policy is provided in Table 20. The detailed screening confirmed no LSE on the European sites considered in this assessment and no further assessment of these allocations alone or in combination is required.	**No LSE alone or in combination**

Policy	European site Potentially Affected	Potential Effects	Detailed Assessment	Conclusion
PC11: Mostyn Docks	Dee Estuary SPA/ Ramsar site/ SAC	This policy outlines the potential for development at Mostyn Docks. Redevelopment at this site has the potential to impact European sites through changes to water quality, disturbance/ displacement of SPA/ Ramsar site species and recreational pressure.	Detailed screening of the Mostyn Docks allocation is provided in Table 20. The detailed screening confirmed no LSE on the European sites considered in this assessment and no further assessment of this allocation alone or in combination is required.	**No LSE alone or in combination**
PC12: Community Facilities	Dee Estuary SPA/ Ramsar site Deeside and Buckley Newt SAC	This policy sets out the areas within towns and villages where new community facilities will be permitted. New community development has the potential to impact European sites through changes to water quality, disturbance/ displacement of SPA/ Ramsar site species and recreational pressure.	Detailed screening of the three allocations associated with this policy is provided in Table 20. Although this policy could lead to development, *new education, health and community facilities will be permitted on suitable sites within settlement boundaries. Outside settlement boundaries, development will only be permitted through conversion or extension of existing buildings, by extension to an existing facility; or adjoining a settlement boundary or on suitable brownfield or previously developed land* and as such there would be no likely significant effects of this type of development on European sites	**No LSE alone or in combination**
PE8: Development within Primary Shopping Areas	Dee Estuary SPA/ Ramsar site Deeside and Buckley Newt SAC	This policy sets out the two sites allocated for retail development. New retail development has the potential to impact European sites through changes to water quality, disturbance/ displacement of SPA/ Ramsar site species and recreational pressure.	Detailed screening of the two retail allocations associated with this policy is provided in Table 20. The detailed screening confirmed no LSE on the European sites considered in this assessment and no further assessment of these allocations alone or in combination is required.	**No LSE alone or in combination**
EN13: Renewable and Low Carbon Energy Development	Dee Estuary SPA/ Ramsar site Deeside and Buckley Newt SAC	This policy sets out Flintshire's scope for renewable solar and wind developments. Land is specifically allocated for three solar farms, and the policies map includes areas of potential solar development (although no sites are currently allocated in these areas). New renewable development has the potential to impact European sites through changes to water quality, disturbance/ displacement of SPA/ Ramsar site/SAC species.	Detailed screening of the two solar farms allocated under this policy are provided in Table 20. The detailed screening confirmed no LSE associated with either of the two solar farm allocations. Consultation with NRW has been carried out in relation to Castle Park, Flint (Policy: EN13, Ref: EN13.2) and a project specific HRA is currently being produced which will provide further evidence to rule out LSE associated with future development at this allocation. In relation to the areas of potential solar development (shown on the policies map), these have been identified following a rigorous filtering exercise by Flintshire Council to identify areas of search for solar in the least constrained areas of the County (including avoidance of designated sites). The policy states that: *All renewable or low carbon energy proposals will be permitted provided that:* *ii. the siting, design, layout, type of installation and materials used do not have a significant adverse effect on the character and features of the proposed location;* In the case of wind energy proposals: *i. the turbines are appropriately designed so as to avoid, or mitigate against, unacceptable environmental impacts, including noise, light reflection and shadow flicker.* Therefore, future renewable energy development will not be permitted if potential impacts on designated sites cannot be ruled out. No further assessment of this policy is required alone or in combination.	**No LSE alone or in combination**
EN25: Sustainable Minerals Development	Dee Estuary SPA/ Ramsar site	This policy details the proposed extension of four minerals sites. New development associated with minerals extraction has the potential to impact European sites through changes to water quality,	Detailed screening of the four minerals allocations confirmed no LSE on European sites considered in this assessment and no further assessment of these allocations alone or in combination is required.	**No LSE alone or in combination**

Policy	European site Potentially Affected	Potential Effects	Detailed Assessment	Conclusion
	Deeside and Buckley Newt SAC	disturbance/ displacement of SPA/ Ramsar site species and recreational pressure.		

Table 20: Detailed Screening of allocations within the LDP

Local Plan Sites	European Site to which impact pathway identified	Area (ha)	Planning Status (as at January 2019)	Site description	Potential Impacts	Conclusion
Policy STR3 – Strategic Sites (Mixed Use Allocations)						
Northern Gateway Mixed Use Development Site Ref: STR3A	River Dee and Bala Lake SAC (Adjacent) Dee Estuary SAC/SPA/Ramsar site (100 m)	166	Development at the allocation is set out within phases. Outline planning granted for 1,300 units. Construction not yet commenced.	Large site comprising mix of brownfield and farmland to the north west of Garden City and south of large industrial area.	As part of the Environmental Statement (undertaken for Praxis by Middlemarch Environmental Ltd, 2010) for the Masterplan of the allocation site, extensive ecological surveys were carried out. An Appropriate Assessment was also carried out for the Masterplan of the allocation site (undertaken for Praxis by Middlemarch Environmental Ltd, 2010, Appendix D2). The Appropriate Assessment concluded that with mitigation measures in place there would be no adverse effect on the integrity of any nearby European sites. Developments are therefore being undertaken in line with Framework Ecological Mitigation Strategies for both north (2015) and south (2017) development sites, with ecological surveys and mitigation updated for each planning application.	**No adverse effect alone or in combination (with mitigation measures in place).**
Warren Hall Mixed Use Development Site Ref: STR3B	No impact pathways to European sites identified	74	Outline planning granted for business park. Allocation for 300 new homes. Site will include 22.7ha of B1 and high-quality B2 employment land, commercia hub, strategic landscaping and GI network and sustainable transport links with nearby settlements.	Greenfield site to the south west of Broughton.	None anticipated.	**No LSE alone or in combination.**
Policy HN1 - Main Service Centres						
Well Street, Buckley Ref: HN1.1	No impact pathways to European sites identified	5.3	A planning application is expected this year. Total allocation for 159 units.	Housing allocation in UDP. The site is likely to come forward as part of the Council's own house building New Homes programme. Site comprises two arable fields on south western edge of Buckley.	None anticipated	**No LSE alone or in combination**
Broad Oak, Holding, Mold Rd, Connah's Quay Ref: HN1.2	Deeside and Buckley Newt Sites SAC (15 m)	1.3	Application reference 058583 is being considered for the construction of 33 no. dwellings. Total allocation for 32 units.	Part of a larger UDP housing allocation. Site comprises two small horse grazed pasture fields on western edge of Connah's Quay.	**Recreational pressure** The allocation is located 15 m to the north of Broad Oak Nature Reserve which forms one of the SAC compartments. Whilst there are no direct access points adjacent to the allocation into the nature reserve, there is public access into the site. The management plan for the SAC acknowledges the regular recreational use of a number of the compartments that form the SAC. Recreational activities likely to cause the most harm to the qualifying features are identified as fishing and off-roading, both of these activities are restricted within the SAC boundaries. The SAC management plan includes regular management of the ponds and terrestrial habitats to ensure they remain suitable and surveys are undertaken regularly to monitor the population. The addition of 37 new dwellings close to the SAC could lead to an increase in recreational use of the site, however, management practices already in place would ensure that a likely significant effect does not occur. In addition, as the allocation lies within 500m of the SAC, any future development at the site would also be required to comply with the Great Crested Newt Mitigation Requirements Supplementary Planning Guidance which will accompany the LDP. **In combination effects** There are no other allocations which would affect the same SAC compartment, and therefore potential in combination effects can be ruled out.	**No LSE alone or in combination**
Highmere Drive, Connah's Quay Ref: HN1.3	Dee Estuary SAC/SPA/Ramsar site (900 m)	5.0	There is a pre-application under consideration for 100 affordable dwellings. Total allocation for 150 units.	Housing allocation in UDP. Site comprises a single arable field along the western edge of Connah's Quay.	**Recreational Pressure** The allocation is located 900 m from the Dee Estuary. There is the potential for increased disturbance to species/habitats associated with the Dee Estuary through an increase in visitor numbers as a result of new residential development within 3.5 km of the European sites. However, given the size of the site (150 houses), and access to existing recreational areas, there would be no likely significant effects alone. **In combination effects**	**No LSE alone** **Further In combination assessment required**

					Although not significant alone, the site will be considered in combination with all other residential developments within 3.5 km of the SPA/ Ramsar site/SAC.	
Northop Road, Flint Ref: HN1.4	Dee Estuary SAC/SPA/Ramsar site (1.5 km)	9.1	Total allocation for 170 units	Site comprises three arable fields and a grassland field to the east. The site is located south of Flint.	**Recreational Pressure** The allocation is located 1.5 km from the Dee Estuary. There is the potential for increased disturbance to species/habitats associated with the Dee Estuary through an increase in visitor numbers as a result of new residential development within 3.5 km of the European sites. However, given the relatively small size of the site (170 houses), and access to existing recreational areas within Flint to the north of the allocation, there would be no likely significant effects alone. **In combination effects** Although not significant alone, the site will be considered in combination with all other residential developments within 3.5 km of the SPA/ Ramsar site/SAC.	**No LSE alone** **Further In combination assessment required**
Maes Gwern, Mold Ref: HN1.5	No impact pathways to European sites identified	5.7	Planning permission granted 25/07/2018 and construction started. Total allocation for 160 units.	Inside Mold settlement boundary in UDP. Site on southern edge of Mold, already under construction	None anticipated	**No LSE alone or in combination**
Land between Denbigh Road and Gwernaffield Rd, Mold Ref: HN1.6	No impact pathways to European sites identified	12.1	Anwyl Homes have submitted a pre-application and are working towards planning application for 246 units. Total allocation for 246 units.	Open countryside abutting settlement boundary in UDP. Flood risk on part of MOL044. Site comprises two areas of grazing pasture on north western edge of Mold.	None anticipated	**No LSE alone or in combination**
Policy HN1 - Local Service Centres						
Holywell Road/ Green Lane, Ewloe Ref: HN1.7	Deeside and Buckley Newt Sites SAC (170 m) Dee Estuary SAC/SPA/Ramsar site (2.6 km)	9.9	No recent planning history. Total allocation for 288 units.	Open countryside and green barrier in UDP abutting settlement boundary. Site comprises a series of arable and grassland fields on the north western edge of Ewloe Green.	**Recreational pressure (Dee and Buckley Newt SAC)** The allocation is located within 170 m of Wepre Park Country Park which forms one of the SAC compartments. A public footpath from the western boundary of the allocation provides a direct link north to the edge of the Park, a walk of approximately 560 m. It is also possible to access the Park via the B5125 from the northern end of the allocation, a distance of approximately 490 m. The SAC compartment is already exposed to regular recreational activity. The management plan for the SAC acknowledges the regular recreational use of a number of the compartments that form the SAC. Recreational activities likely to cause the most harm to the qualifying features are identified as fishing and off-roading, both of these activities are restricted within the SAC boundaries. The SAC management plan includes regular management of the ponds and terrestrial habitats to ensure they remain suitable and surveys are undertaken regularly to monitor the population. Whilst the addition of 225 units close to the SAC could lead to an increase in recreational use of the site, management practices already in place would ensure that a likely significant effect does not occur. In addition, any future development at the site would also be required to comply with the Great Crested Newt Mitigation Requirements Supplementary Planning Guidance which will accompany the LDP. **Recreational pressure (Dee Estuary SPA/ Ramsar site/SAC)** The allocation is located 2.6km from the Dee Estuary. There is the potential for increased disturbance to species/habitats associated with the Dee Estuary through an increase in visitor numbers as a result of new residential development within 3.5 km of the European sites. Given the size of the site (255 houses), and access to alternative recreational areas, there would be no likely significant effects alone. **In combination effects (Dee Estuary SPA/ Ramsar site/SAC)** Although not significant alone, the site will be considered in combination with all other residential developments within 3.5 km of the SPA/ Ramsar site/SAC.	**No LSE alone** **Further In combination assessment required**

Ash Lane, Hawarden Ref: HN1.8	Dee Estuary SAC/SPA/Ramsar site (2.3 km)	9.6	No recent planning history. Some concern about impact on setting on the grade 1 listed building. Total allocation for 288 units	Open countryside and green barrier in UDP abutting settlement boundary. Site comprises five grassland/arable fields surrounded to the west, north and east by Mancot and Little Mancot.	**Recreational pressure** The allocation is located 2.3 m from the Dee Estuary. There is the potential for increased disturbance to species/habitats associated with the Dee Estuary through an increase in visitor numbers as a result of new residential development within 3.5 km of the European sites. Given the size of the site (288 houses), and access to alternative recreational areas, there would be no likely significant effects alone. **In combination effects** Although not significant alone, the site will be considered in combination with all other residential developments within 3.5 km of the SPA/ Ramsar site/ SAC.	**No LSE alone** **Further In combination assessment required**
Wrexham Rd, HCAC Ref:HN1.9	No impact pathways to European sites identified	3.5	An outline application for up to 80 dwellings is currently under consideration reference 058163. Total allocation for 80 units.	Open countryside in UDP. Grade 2 agricultural land. Site comprises two grassland fields on western edge of Abermorddu.	None anticipated	**No LSE alone or in combination.**
Policy HN1 - Sustainable Villages						
Cae Isa, A5119, New Brighton Ref: HN1.10	No impact pathways to European sites identified	3.5	Open countryside and green barrier in UDP abutting settlement boundary. No recent planning history. Total allocation for 105 units.	Site comprises a single grassland field with patches of soft rush / scrub on northern edge of New Brighton.	None anticipated	**No LSE alone or in combination.**
Chester Road, Penymynydd Ref: HN1.11	No impact pathways to European sites identified	7.7	Planning permission granted on appeal and construction started. Total allocation for 186 units.	Site on eastern edge of Penymynedd, already under construction	None anticipated	**No LSE alone or in combination.**
Policy HN8 - Gypsy and Traveller Sites						
Magazine Lane, Ewloe (Extension) Ref: HN8.1	Deeside and Buckley Newt Sites SAC (400m)	0.26ha	No recent planning history	New allocation since the UDP. The site comprises a single small field surrounded by trees. The allocation site is adjacent to the A55 and existing development.	None anticipated	**No LSE alone or in combination**
Gwern Lane, Cae Estyn, Hope (Extension) Ref: HN8.2	No impact pathways to European sites identified	0.29ha	No recent planning history	New allocation since the UDP. The site comprises a small grassland field.	None anticipated	**No LSE alone or in combination**
Riverside, Queensferry (Extension) Ref: HN8.3	Dee Estuary SAC/SPA/Ramsar site (100 m)	1.57ha	No recent planning history	New allocation since the UDP. The site comprises hardstanding and scrub. The allocation site is surrounded by existing development.	None anticipated	**No LSE alone or in combination**

Castle Park Industrial Estate Ref: HN8.4	Dee Estuary SAC/SPA/Ramsar site (adjacent)	0.13ha	No recent planning history	New allocation since the UDP. The site comprises a small area of hardstanding adjacent to the Estuary.	**Disturbance/ displacement of Dee Estuary SPA/ Ramsar site species** The allocation is surrounded by woodland and scrub, screening the site from the nearby Estuary. The small-scale use of the allocation as a transit site for up to six gypsy and traveller pitches would not lead to significant disturbance/ displacement effects on the Dee Estuary SPA/ Ramsar site species alone or in combination.	**No LSE alone or in combination**
Policy PE1 - Employment Allocations						
Chester Aerospace Park Ref: PE1.1	Dee Estuary SPA/Ramsar site (5 km)	5.72	Planning permission granted for new industrial unit and parking at south west of allocation. Planning permission under consideration for industrial units and car parking at the northern end of the allocation.	New allocation boundary, changed since UDP Site comprises a single field site adjacent to existing Hawarden Business Park and Airfield	None anticipated	**No LSE alone or in combination**
Manor Lane/Hawarden Park Extension Ref PE1.2	Dee Estuary SPA/Ramsar site (5 km)	18.2	Planning permission granted for industrial units and car parking (phased development)	Allocation to the south of existing industrial park to cater for aerospace sector spin-offs and enable improved access in UDP. Site comprises three fields adjacent to existing Hawarden Business Park and Airfield	None anticipated	**No LSE alone or in combination**
Drury New Road Ref: PE1.3	Deeside and Buckley Newt Sites SAC (adjacent)	1.4	No recent planning history	New allocation to reflect vacant land to the north of access road to former Optec factory in the UDP. Site comprises a single field. Existing development to the south and west. Drury New Road to the east	**Recreational pressure** The allocation is directly adjacent to the SAC on its northern and western boundaries. A footpath is present to the west of the allocation which links to other footpaths within the SAC boundary. Whilst there is the potential for new employees to utilise the adjacent footpath, realistically it is unlikely that there would be an increase in recreational use of the SAC from this type of development. As the allocation lies within 500m of the SAC, any future development at the site would also be required to comply with the Great Crested Newt Mitigation Requirements Supplementary Planning Guidance. **In combination effects** One other allocation could affect the same SAC compartment (Chester Rd / Bannel Lane, Buckley Ref: BUC030/ 037). Whilst the addition of 129 units close to the SAC could lead to an increase in recreational use of the site, the addition of the Drury New Road employment site would not add to the potential impact (as described for the Chester Rd/ Bannel Lane allocation, management practices already in place for the SAC, and the requirement to comply with the Great Crested Newt Mitigation Requirements Supplementary Planning Guidance would ensure that a likely significant effect does not occur). Therefore, potential in combination effects can be ruled out.	**No LSE alone or in combination**
Greenfield Business Park, Phase II Ref: PE1.4	Dee Estuary SAC/SPA/Ramsar site (adjacent)	1.2	No recent planning history	New allocation boundary, changed since UDP Small brown field site adjacent to the exiting development within Greenfield Business Park	**Recreational pressure** Although the wales coast path borders the north of the allocation, given that the allocation is located within an existing industrial area, these new developments are unlikely to contribute to a significant increase in the number of people working in those areas. It is also considered unlikely that new employees from any future development of these small development sites would choose to regularly use this footpath in large numbers such that they would have a likely significant effect on a European site alone, or in combination. **Disturbance/ displacement of Dee Estuary SPA/ Ramsar site species** The intertidal habitat within the Estuary, adjacent to the allocation, is known to support wintering waders and waterfowl (the nearest high tide roost (for oystercatcher) is more than 2km south of the allocation). Although there may be some localised disturbance/ displacement to birds in the vicinity of works (should they take place during the winter), it is considered unlikely to have a significant effect on the qualifying species of the SPA/ Ramsar site alone or in combination with the other three developments adjacent to the Estuary (which would be phased throughout the plan period, and therefore unlikely to be all developed at the same time). **Water quality** Although there is not a direct link with the Estuary from the allocation, it does lie directly adjacent, and therefore there is the potential for construction site run off. However, given the small-scale (1 ha), short-term nature of any future development at the site, in conjunction with the requirement to comply with	**No LSE alone or in combination**

					standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SPA/ Ramsar site/ SAC are anticipated alone or in combination.	
Greenfield Business Park, Phase III Ref: PE1.5	Dee Estuary SAC/SPA/Ramsar site (adjacent)	4.4	Planning permission granted for works in the north west compartment. Planning application pending for warehouse and offices within the south west compartment.	New allocation boundary, changed since UDP Sites comprises two compartments made up of predominantly scrub with small sections of grassland and hard standing (within the exiting development within Greenfield Business Park)	**Recreational pressure** Although the wales coast path borders the north of the allocation, given that the allocation is located within an existing industrial area, these new developments are unlikely to contribute to a significant increase in the number of people working in those areas. It is also considered unlikely that new employees from any future development of these small development sites would choose to regularly use this footpath in large numbers such that they would have a likely significant effect on a European site alone, or in combination. **Disturbance/ displacement of Dee Estuary SPA/ Ramsar site species** The intertidal habitat within the Estuary, to the north east of the allocation, is known to support wintering waders and waterfowl (nearest high tide roost (for oystercatcher) more than 1.3km south of the allocation). The compartment to the southwest is more than 300 m from the estuary, and is separated from the SPA/ Ramsar site by existing vegetation and the railway line. No significant disturbance/ displacement effects from any future development at this location are considered likely. Although the second compartment is closer to the estuary (less than 100 m), it is also separated from the estuary by existing development and vegetation, and as such significant disturbance/ displacement effects are also considered unlikely alone or in combination with the other three developments adjacent to the Estuary (which would be phased throughout the plan period, and therefore unlikely to be all developed at the same time). **Water quality** Although there is not a direct link with the Estuary from the allocation, it does lie directly adjacent, and therefore there is the potential for construction site run off. However, given the small-scale (1 ha), short-term nature of any future development at the site, in conjunction with the requirement to comply with standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SPA/ Ramsar site/SAC are anticipated alone or in combination.	**No LSE alone or in combination**
Broncoed Industrial Estate Ref: PE1.6	No impact pathways to European sites identified	0.7	Planning under consideration for development at the northern end of the allocation Planning permission granted for industrial use at southern end of the allocation	New allocation boundary, changed since UDP Brownfield site within existing Broncoed Industrial Estate	None anticipated	**No LSE alone or in combination**
Mold Business Park Ref: PE1.7	No impact pathways to European sites identified	3.9	Planning permission granted for new office buildings and associated infrastructure	New allocation boundary, changed since UDP Site comprises existing development and areas of woodland and scrub, south of Mold	None anticipated	**No LSE alone or in combination**
Adjacent Mostyn Docks Ref: PE1.8 (and Policy PC11)	Dee Estuary SAC/SPA/Ramsar site (adjacent)	3.0	No recent planning history	New allocation boundary, changed since UDP Brown field site comprising scrub and grassland, adjacent to Dee Estuary.	**Recreational pressure** Although the Wales Coast path borders the eastern boundary of the allocation, given that the allocation is located within an existing industrial area, these new developments are unlikely to contribute to a significant increase in the number of people working in those areas. It is also considered unlikely that new employees from any future development of these small development sites would choose to regularly use this footpath in large numbers such that they would have a likely significant effect on a European site alone, or in combination. **Disturbance/ displacement of Dee Estuary SPA/ Ramsar site species** The intertidal habitat within the Estuary, adjacent to the allocation, is known to support wintering wader and waterfowl (including a high tide roost for oystercatcher). Although there may be some localised disturbance/ displacement to birds in the vicinity of the works (should they take place during the winter), it is considered that this is unlikely to have a significant effect on the qualifying species of the SPA/ Ramsar site alone or in combination with the other three developments adjacent to the Estuary (which	**No LSE alone or in combination**

					would be phased throughout the plan period, and therefore unlikely to be all developed at the same time). **Water quality** Although there is not a direct link with the Estuary from the allocation, it does lie directly adjacent, and therefore there is the potential for construction site run off. However, given the small-scale (3 ha), short-term nature of any future development at the site, in conjunction with the requirement to comply with standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SPA/ Ramsar site/SAC are anticipated alone or in combination. Policy PC11 within the LDP also states that '*Development proposals which enhance the transport and employment role of the docks will be permitted provided that such proposals do not have a significant adverse effect on the ecological, landscape, historic, recreational integrity and water and air quality of the Dee Estuary*'.	
Chester Road East Ref: PE1.9	Dee Estuary SAC/SPA/Ramsar site (1.7 km) River Dee and Bala Lake SAC (475 m)	3.15	Planning permission refused on western part of the allocation (in relation to flood risk) No other current planning applications on the site	New allocation boundary, changed since UDP Site comprises an area of scrub and rough grassland surrounded by existing development and roads on all sides.	None anticipated	**No LSE alone or in combination**
Antelope Industrial Estate Ref: PE1.10	No impact pathways to European sites identified	1.1	No recent planning history	Retained as an allocation in the UDP Site comprises two areas of grassland adjacent to existing industrial units within Antelope Industrial Estate	None anticipated	**No LSE alone or in combination**
River Lane, Saltney Ref: PE1.11	River Dee and Bala Lake SAC (20 m)	1.08	No recent planning history	New allocation boundary, changed since UDP Existing industrial area/ brown field site, surrounded by development to the south, east and west. The River Dee lies adjacent to the northern boundary.	**Water quality** Although there is not a direct link with the River Dee from the allocation, it does lie directly adjacent to River Dee and Bala Lake SAC, and therefore there is the potential for construction site run off. However, given the small-scale (1 ha), short-term nature of any future redevelopment at the site, in conjunction with the requirement to comply with standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SAC are anticipated alone or in combination.	**No LSE alone or in combination**
Rowley's Drive Ref: PE1.12	Dee Estuary SAC/SPA/Ramsar site (390 m) River Dee and Bala Lake SAC (390 m)	0.7	Outline planning application on the northern compartment for car sales, commercial units and storage area. Application for units and car parking on the southern compartment refused.	New allocation boundary, changed since UDP Two small compartments within existing industrial area. One compartment comprises scrub and woodland, and the second hard standing.	**Recreational pressure** Although there is the potential to reach the Dee Estuary SPA/Ramsar site/ SAC from the allocation (via a public footpath to the east of the allocation which leads to the Wales Coast), realistically, it is considered unlikely that new employees from any future development of the site would choose to regularly use this footpath in large numbers such that they would have a likely significant effect on a European site alone. There are no other employment sites in the vicinity which could affect the same area of coast, and therefore there would be no in combination effects.	**No LSE alone or in combination**
Policy PE2 – Principal Employment Areas						
Ewole Barns (Industrial Estate), Alltami Ref: PE2.1	River Dee and Bala Lake SAC (4.7km) Deeside and Buckley Newt Sites SAC (adjacent)	4.91	No recent planning history	Existing industrial area/ brown field site, surrounded by agricultural land.	**Recreational pressure** The allocation is directly adjacent to the SAC on its southern boundary. A footpath is present within the allocation which links to other footpaths within the SAC boundary. Whilst there is the potential for new employees to utilise the adjacent footpath, realistically it is unlikely that there would be an increase in recreational use of the SAC from this type of development. As the allocation lies within 500m of the SAC, any future development at the site would also be required to comply with the Great Crested Newt Mitigation Requirements Supplementary Planning Guidance.	**No LSE alone or in combination**
Alltami Depot, Alltami Ref: PE2.2	River Dee and Bala Lake SAC (4.7km) Deeside and Buckley Newt Sites SAC (101m)	8.76	No recent planning history	Existing industrial area/ brown field site, surrounded by agricultural land and a quarry	**Recreational pressure** The allocation is directly adjacent to the SAC on its eastern boundary. A footpath is present within the allocation which links to other footpaths within the SAC boundary. Whilst there is the potential for new employees to utilise the adjacent footpath, realistically it is unlikely that there would be an increase in recreational use of the SAC from this type of development. As the allocation lies within 500m of the SAC, any future development at the site would also be required to comply with the Great Crested Newt Mitigation Requirements Supplementary Planning Guidance.	**No LSE alone or in combination**

Manor Industrial Estate, Bagillt Ref: PE2.3	Dee Estuary SAC/SPA/Ramsar site (358m) River Dee and Bala Lake SAC (6.5km)	12.4	No recent planning history	Existing Industrial area surrounded by woodland and bounded by the railway line and the A548	None anticipated	**No LSE alone or in combination**
Broughton Mills, Broughton Ref: PE2.4	River Dee and Bala Lake SAC (1.3km) Deeside and Buckley Newt Sites SAC (6.3km)	7.96	No recent planning history	Existing Industrial area, surrounded by agricultural land and an airport to the north	None anticipated	**No LSE alone or in combination**
Catheralls Industrial Estate and Pinfold Industrial Estate, Buckley Ref: PE2.5	River Dee and Bala Lake SAC (4.7km) Deeside and Buckley Newt Sites SAC (adjacent)	7.03	No recent planning history	Existing Industrial area, surrounded by agricultural land	**Recreational pressure** The allocation is directly adjacent to the SAC on its northern boundary. A footpath is present within the allocation which links to other footpaths within the SAC boundary. Whilst there is the potential for new employees to utilise the adjacent footpath, realistically it is unlikely that there would be an increase in recreational use of the SAC from this type of development. As the allocation lies within 500m of the SAC, any future development at the site would also be required to comply with the Great Crested Newt Mitigation Requirements Supplementary Planning Guidance.	**No LSE alone or in combination**
Drury Lane Industrial Estate, Buckley Ref: PE2.6	Dee Estuary SAC/SPA/Ramsar site (6.4km) River Dee and Bala Lake SAC (5km) Deeside and Buckley Newt Sites SAC (154m)	1.71	No recent planning history	Existing Industrial area, surrounded by grassland and woodland	None anticipated	**No LSE alone or in combination**
Little Mountain Industrial Estate, Buckley Ref: PE2.7	River Dee and Bala Lake SAC (5.6km) Deeside and Buckley Newt Sites SAC (adjacent)	8.71	No recent planning history	Existing Industrial area, surrounded by agricultural land and woodland	**Recreational pressure** The allocation is directly adjacent to the SAC on its northern boundary. A footpath is present within the allocation which links to other footpaths within the SAC boundary. Whilst there is the potential for new employees to utilise the adjacent footpath, realistically it is unlikely that there would be an increase in recreational use of the SAC from this type of development. As the allocation lies within 500m of the SAC, any future development at the site would also be required to comply with the Great Crested Newt Mitigation Requirements Supplementary Planning Guidance.	**No LSE alone or in combination**
Spencer Industrial Estate, Buckley Ref: PE2.8	River Dee and Bala Lake SAC (4.9km) Deeside and Buckley Newt Sites SAC (adjacent)	7.26	No recent planning history	Existing Industrial area, surrounded by grassland and woodland	**Recreational pressure** The allocation is directly adjacent to the SAC on its northern and western boundaries. A footpath is present within the allocation which links to other footpaths within the SAC boundary. Whilst there is the potential for new employees to utilise the adjacent footpath, realistically it is unlikely that there would be an increase in recreational use of the SAC from this type of development. As the allocation lies within 500m of the SAC, any future development at the site would also be required to comply with the Great Crested Newt Mitigation Requirements Supplementary Planning Guidance.	**No LSE alone or in combination**
Evans Business Centre, Chester West Ref: PE2.9	River Dee and Bala Lake SAC (994m)	7.81	No recent planning history	Existing Industrial area, surrounded by agricultural land and existing development	None anticipated	**No LSE alone or in combination**

Dock Road, Connah's Quay Ref: PE2.10	Dee Estuary SAC/SPA/Ramsar site (1.2km) River Dee and Bala Lake SAC (adjacent)	13.8	No recent planning history	Existing Industrial area adjacent to the River Dee with an area of scrub	**Recreational pressure** Although the Wales coast path borders the north of the allocation, given that the allocation is located within an existing industrial area, these new developments are unlikely to contribute to a significant increase in the number of people working in those areas. It is also considered unlikely that new employees from any future development of these small development sites would choose to regularly use this footpath in large numbers such that they would have a likely significant effect on a European site alone, or in combination. **Water quality** Although there is not a direct link with the River Dee from the allocation, it does lie directly adjacent to River Dee and Bala Lake SAC, and therefore there is the potential for construction site run off. However, given the small-scale (1 ha), short-term nature of the Construction Phase of any future redevelopment at the site, in conjunction with the requirement to comply with standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SAC are anticipated alone or in combination.	**No LSE alone or in combination**
Deeside Industrial Park, DARA and Northern Gateway, Deeside Ref: PE2.11	Dee Estuary SAC/SPA/Ramsar site (182m) River Dee and Bala Lake SAC (adjacent)	930.3	Development at the Northern Gateway Mixed Use Development Site allocation is set out within phases. Outline planning granted for 1,300 units. Construction not yet commenced.	Large site comprising mix of brownfield and farmland to the north west of Garden City and south of large industrial area.	**Recreational pressure** Although the Wales coast path borders the south of the allocation, given that the allocation is located within an existing industrial area, these new developments are unlikely to contribute to a significant increase in the number of people working in those areas. It is also considered unlikely that new employees from any future development of these small development sites would choose to regularly use this footpath in large numbers such that they would have a likely significant effect on a European site alone, or in combination. **Water quality** Although there is not a direct link with the River Dee from the allocation, it does lie directly adjacent to River Dee and Bala Lake SAC, and therefore there is the potential for construction site run off. However, given the small-scale (1 ha), short-term nature of the Construction Phase any future redevelopment at the site, in conjunction with the requirement to comply with standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SAC are anticipated alone or in combination.	**No LSE alone or in combination**
St Davids Park, Ewole Ref: PE2.12	Dee Estuary SAC/SPA/Ramsar site (4.8km) River Dee and Bala Lake SAC (3.1km) Deeside and Buckley Newt Sites SAC (697m)	13.44	No recent planning history	Existing Industrial area, surrounded by existing development and roads.	None anticipated	**No LSE alone or in combination**
Ashmount Industrial Estate, Flint Ref: PE2.13	Dee Estuary SAC/SPA/Ramsar site (adjacent) River Dee and Bala Lake SAC (4.6km)	13.7	No recent planning history	Existing Industiral area adjacent to the River Dee and parkland.	**Recreational pressure** Although the Wales coast path borders the south of the allocation, given that the allocation is located within an existing industrial area, these new developments are unlikely to contribute to a significant increase in the number of people working in those areas. It is also considered unlikely that new employees from any future development of these small development sites would choose to regularly use this footpath in large numbers such that they would have a likely significant effect on a European site alone, or in combination. **Disturbance/ displacement of Dee Estuary SPA/ Ramsar site species** The intertidal habitat within the Estuary, adjacent to the allocation, is known to support wintering wader and waterfowl (including a high tide roost for oystercatcher). Although there may be some localised disturbance/ displacement to birds in the vicinity of construction works (should they take place during the winter), it is considered that this is unlikely to have a significant effect on the qualifying species of the SPA/ Ramsar site alone or in combination with the other three developments adjacent to the Estuary (which would be phased throughout the plan period, and therefore unlikely to be all developed at the same time).	**No LSE alone or in combination**

					Water quality Although there is not a direct link with the Estuary from the allocation, it does lie directly adjacent, and therefore there is the potential for construction site run off. However, given the small-scale (3 ha), short-term nature of the Construction Phase associated with any future development at the site, in conjunction with the requirement to comply with standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SPA/ Ramsar site/SAC are anticipated alone or in combination. Policy PC11 within the LDP also states that '*Development proposals which enhance the transport and employment role of the docks will be permitted provided that such proposals do not have a significant adverse effect on the ecological, landscape, historic, recreational integrity and water and air quality of the Dee Estuary*'.	
Castle Park/ Ashmount Industrial Centre, Flint Ref: PE2.14	Dee Estuary SAC/SPA/Ramsar site (93m) River Dee and Bala Lake SAC (4.6km)	23.7	No recent planning history	Existing Industrial area surrounded by existing development and woodland	None anticipated	**No LSE alone or in combination**
Greenfield Business Park, Greenfield Ref: PE2.15	Dee Estuary SAC/SPA/Ramsar site (adjacent)	36	Planning permission granted for works in the north west compartment. Planning application pending for warehouse and offices within the south west compartment.	Existing Industrial area adjacent to the River Dee and either side of the railway line	**Recreational pressure** Although the Wales coast path borders the north of the allocation, given that the allocation is located within an existing industrial area, these new developments are unlikely to contribute to a significant increase in the number of people working in those areas. It is also considered unlikely that new employees from any future development of these small development sites would choose to regularly use this footpath in large numbers such that they would have a likely significant effect on a European site alone, or in combination. **Disturbance/ displacement of Dee Estuary SPA/ Ramsar site species** The intertidal habitat within the Estuary, adjacent to the allocation, is known to support wintering wader and waterfowl (including a high tide roost for oystercatcher). Although there may be some localised disturbance/ displacement to birds in the vicinity of the works (should construction works take place during the winter), it is considered that this is unlikely to have a significant effect on the qualifying species of the SPA/ Ramsar site alone or in combination with the other three developments adjacent to the Estuary (which would be phased throughout the plan period, and therefore unlikely to be all developed at the same time). **Water quality** Although there is not a direct link with the Estuary from the allocation, it does lie directly adjacent, and therefore there is the potential for construction site run off. However, given the small-scale (3 ha), short-term nature of the Construction Phase associated with any future development at the site, in conjunction with the requirement to comply with standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SPA/ Ramsar site/SAC are anticipated alone or in combination. Policy PC11 within the LDP also states that '*Development proposals which enhance the transport and employment role of the docks will be permitted provided that such proposals do not have a significant adverse effect on the ecological, landscape, historic, recreational integrity and water and air quality of the Dee Estuary*'.	**No LSE alone or in combination**
Hawarden Industrial Park, Chester Aerospace Park and Hawarden Airport, Hawarden Ref: PE2.16	Dee Estuary SAC/SPA/Ramsar site (7.4km) River Dee and Bala Lake SAC (737m) Deeside and Buckley Newt Sites SAC (5km)	369.47	Planning permission granted for new industrial unit and parking at south west of allocation. Planning permission under consideration for industrial units and car parking at the northern end of the allocation.	Existing Industrial area and airport surrounded by agricultural land	None anticipated	**No LSE alone or in combination**
Broncoed Industrial Estate, Mold Ref: PE2.17	Deeside and Buckley Newt Sites SAC (3.5km)	3.88	Planning under consideration for development at the northern end of the allocation Planning permission granted for industrial use at southern end of the allocation	Existing Industrial area surrounded by exiting development and roads	None anticipated	**No LSE alone or in combination**

Mold Business Park, Mold Ref: PE2.18	Deeside and Buckley Newt Sites SAC (3.5km)	2.87	Planning permission granted for new office buildings and associated infrastructure	Existing Industrial area surrounded by exiting development and roads	None anticipated	**No LSE alone or in combination**
Mold Industrial Estate, Mold Ref: PE2.19	Deeside and Buckley Newt Sites SAC (2.9km)	16.27	No recent planning history	Existing Industrial area surrounded by exiting development and roads	None anticipated	**No LSE alone or in combination**
Mostyn Docks, Mostyn Ref: PE2.20	Dee Estuary SAC/SPA/Ramsar site (adjacent)	28.7	No recent planning history	Existing Industrial area surrounded by the River Dee	**Recreational pressure** Although the Wales Coast path borders the eastern boundary of the allocation, given that the allocation is located within an existing industrial area, these new developments are unlikely to contribute to a significant increase in the number of people working in those areas. It is also considered unlikely that new employees from any future development of these small development sites would choose to regularly use this footpath in large numbers such that they would have a likely significant effect on a European site alone, or in combination. **Disturbance/ displacement of Dee Estuary SPA/ Ramsar site species** The intertidal habitat within the Estuary, adjacent to the allocation, is known to support wintering wader and waterfowl (including a high tide roost for oystercatcher). Although there may be some localised disturbance/ displacement to birds in the vicinity of the construction works (should they take place during the winter), it is considered that this is unlikely to have a significant effect on the qualifying species of the SPA/ Ramsar site alone or in combination with the other three developments adjacent to the Estuary (which would be phased throughout the plan period, and therefore unlikely to be all developed at the same time). **Water quality** Although there is not a direct link with the Estuary from the allocation, it does lie directly adjacent, and therefore there is the potential for construction site run off. However, given the small-scale (3 ha), short-term nature of the Construction Phase associated with any future development at the site, in conjunction with the requirement to comply with standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SPA/ Ramsar site/SAC are anticipated alone or in combination. Policy PC11 within the LDP also states that '*Development proposals which enhance the transport and employment role of the docks will be permitted provided that such proposals do not have a significant adverse effect on the ecological, landscape, historic, recreational integrity and water and air quality of the Dee Estuary*'.	**No LSE alone or in combination**
Pentre Industrial Estate, Pentre Ref: PE2.21	Dee Estuary SAC/SPA/Ramsar site (4.5km) River Dee and Bala Lake SAC (458m) Deeside and Buckley Newt Sites SAC (2.4km)	15.75	No recent planning history	Existing Industrial area, surrounded by existing development and adjacent to the railway line	None anticipated	**No LSE alone or in combination**
Queensferry Industrial Estate, Pentre Ref: PE2.22	Dee Estuary SAC/SPA/Ramsar site (4.4km) River Dee and Bala Lake SAC (adjacent) Deeside and Buckley Newt	36.58	No recent planning history	Existing Industrial area, adjacent to the River Dee and the railway line	**Recreational pressure** Although the Wales coast path borders the north of the allocation, given that the allocation is located within an existing industrial area, these new developments are unlikely to contribute to a significant increase in the number of people working in those areas. It is also considered unlikely that new employees from any future development of these small development sites would choose to regularly use this footpath in large numbers such that they would have a likely significant effect on a European site alone, or in combination.	**No LSE alone or in combination**

	Sites SAC (2.4km)				**Water quality** Although there is not a direct link with the River Dee from the allocation, it does lie directly adjacent to River Dee and Bala Lake SAC, and therefore there is the potential for construction site run off. However, given the small-scale (1 ha), short-term nature of the Construction Phase associated with any future redevelopment at the site, in conjunction with the requirement to comply with standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SAC are anticipated alone or in combination.	
Expressway Business Park, Queensferry Ref: PE2.23	Dee Estuary SAC/SPA/Ramsar site (3.9km) River Dee and Bala Lake SAC (161m) Deeside and Buckley Newt Sites SAC (2.1km)	1.99	No recent planning history	Existing Industrial area, surrounded by existing development	None anticipated	**No LSE alone or in combination**
Antelope Industrial Park, Rhydymwyn Ref: PE2.24	No impact pathways to European sites identified	5.06	No recent planning history	Existing Industrial area, surrounded by woodland	None anticipated	**No LSE alone or in combination**
Brymau One, Two and Three Estates and Glen Industrial Estate, Saltney Ref: PE2.25	River Dee and Bala Lake SAC (adjacent)	12	No recent planning history	Existing Industrial area, adjacent to the River Dee	**Recreational pressure** Although the Wales coast path borders the north of the allocation, given that the allocation is located within an existing industrial area, these new developments are unlikely to contribute to a significant increase in the number of people working in those areas. It is also considered unlikely that new employees from any future development of these small development sites would choose to regularly use this footpath in large numbers such that they would have a likely significant effect on a European site alone, or in combination. **Water quality** Although there is not a direct link with the River Dee from the allocation, it does lie directly adjacent to River Dee and Bala Lake SAC, and therefore there is the potential for construction site run off. However, given the small-scale (1 ha), short-term nature of the Construction Phase associated with any future redevelopment at the site, in conjunction with the requirement to comply with standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SAC are anticipated alone or in combination.	**No LSE alone or in combination**
The Borders Industrial Park, Chesterbank Industrial Park and Brymau Four Estate, Saltney Ref: PE2.26	River Dee and Bala Lake SAC (adjacent)	12.21	No recent planning history	Existing Industrial area, adjacent to the River Dee	**Recreational pressure** Although the Wales coast path borders the north of the allocation, given that the allocation is located within an existing industrial area, these new developments are unlikely to contribute to a significant increase in the number of people working in those areas. It is also considered unlikely that new employees from any future development of these small development sites would choose to regularly use this footpath in large numbers such that they would have a likely significant effect on a European site alone, or in combination. **Water quality** Although there is not a direct link with the River Dee from the allocation, it does lie directly adjacent to River Dee and Bala Lake SAC, and therefore there is the potential for construction site run off. However, given the small-scale (1 ha), short-term nature of the construction works associated with any future redevelopment at the site, in conjunction with the requirement to comply with standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SAC are anticipated alone or in combination.	**No LSE alone or in combination**

Engineer Park and St Ives Park, Sandycroft Ref: PE2.27	Dee Estuary SAC/SPA/Ramsar site (5.3km) River Dee and Bala Lake SAC (adjacent) Deeside and Buckley Newt Sites SAC (3.3km)	25.75	No recent planning history	Existing Industrial area, adjacent to the River Dee and the railway line	**Recreational pressure** Although the Wales coast path borders the north of the allocation, given that the allocation is located within an existing industrial area, these new developments are unlikely to contribute to a significant increase in the number of people working in those areas. It is also considered unlikely that new employees from any future development of these small development sites would choose to regularly use this footpath in large numbers such that they would have a likely significant effect on a European site alone, or in combination. **Water quality** Although there is not a direct link with the River Dee from the allocation, it does lie directly adjacent to River Dee and Bala Lake SAC, and therefore there is the potential for construction site run off. However, given the small-scale (1 ha), short-term nature of the construction works for any future redevelopment at the site, in conjunction with the requirement to comply with standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SAC are anticipated alone or in combination.	**No LSE alone or in combination**
Glendale Business Park, Sandycroft Ref: PE2.28	Dee Estuary SAC/SPA/Ramsar site (5.1km) River Dee and Bala Lake SAC (458m) Deeside and Buckley Newt Sites SAC (3km)	13.81	No recent planning history	Existing Industrial area, surrounded by existing development and adjacent to the railway line	None anticipated	**No LSE alone or in combination**
Sandycroft Industrial Estate, Sandycroft Ref: PE2.29	Dee Estuary SAC/SPA/Ramsar site (5.9km) River Dee and Bala Lake SAC (adjacent) Deeside and Buckley Newt Sites SAC (3.9km)	32.18	No recent planning history	Existing Industrial area, adjacent to the River Dee and the railway line	**Recreational pressure** Although the Wales coast path borders the north of the allocation, given that the allocation is located within an existing industrial area, these new developments are unlikely to contribute to a significant increase in the number of people working in those areas. It is also considered unlikely that new employees from any future development of these small development sites would choose to regularly use this footpath in large numbers such that they would have a likely significant effect on a European site alone, or in combination. **Water quality** Although there is not a direct link with the River Dee from the allocation, it does lie directly adjacent to River Dee and Bala Lake SAC, and therefore there is the potential for construction site run off. However, given the small-scale (1 ha), short-term nature of the construction works for any future redevelopment at the site, in conjunction with the requirement to comply with standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SAC are anticipated alone or in combination.	**No LSE alone or in combination**
Rowley's Drive, Shotton Ref: PE2.30	Dee Estuary SAC/SPA/Ramsar site (2.9km) River Dee and Bala Lake SAC (371m) Deeside and Buckley Newt Sites SAC (1.2km)	4.88	Outline planning application on the northern compartment for car sales, commercial units and storage area. Application for units and car parking on the southern compartment refused.	Existing Industrial area, surrounded by existing development and adjacent to the railway line	None anticipated	**No LSE alone or in combination**
Policy PE8 - Development within Primary Shopping Areas						

Land North of Broughton Park	No impact pathways to European sites identified	3	Outline planning permission granted on appeal for medical centre, Council contact centre, Hotel, Public House / Restaurant and four class A3 food and drink units	Redevelopment of urban location within Broughton	None anticipated	**No LSE alone or in combination**
Land to the south of Chester Road	No impact pathways to European sites identified	0.7	No recent planning history	Redevelopment of urban location within Mold	None anticipated	**No LSE alone or in combination**
Policy PC12 – Community Facilities						
Community Centre, Woodlane Ref: PC12.1	No impact pathways to European sites identified	0.19	No recent planning history	New allocation boundary since UDP. The site comprises grassland and scrub. The allocation is surrounded by residential development and roads.	None anticipated	**No LSE alone or in combination**
Greenfield Cemetery Ref: PC12.2	Dee Estuary SAC/SPA/Ramsar site (1 km)	0.99	No recent planning history	New allocation boundary since UDP. The site comprises a grassland, scrub/ woodland. The allocation is surrounded by residential development, roads and the existing cemetery to the north and east. Woodland and farmland are to the west and south.	None anticipated	**No LSE alone or in combination**
Treuddyn Cemetery Ref: PC12.3	No impact pathways to European sites identified	0.29	No recent planning history	New allocation boundary since UDP. The site comprises a grassland field surrounded by residential development, roads and the existing cemetery.	None anticipated.	**No LSE alone or in combination**
Policy EN13 - Renewable and Low Carbon Energy Development						
Crumps Yard Solar Farm Ref: EN13.1	Dee Estuary SAC/SPA/Ramsar site (80 m)	3.4	No recent planning history	New allocation boundary changed since UDP. The site comprises scrub and grassland surrounded by existing development and railway.	None anticipated.	**No LSE alone or in combination**
Castle Park, Flint Ref: EN13.2	Dee Estuary SAC/SPA/Ramsar site (adjacent)		No recent planning history	New allocation boundary changed since UDP. The site comprises an area of scrub and grassland adjacent to the Estuary.	**Disturbance/ displacement of Dee Estuary SPA/ Ramsar site species** The allocation is surrounded by woodland and scrub, screening the site from the nearby Estuary. The installation of a new solar farm at this location would not lead to significant disturbance/ displacement effects on the Dee Estuary SPA/ Ramsar site species alone or in combination. Although there may be some localised disturbance/ displacement to birds in the vicinity of the works (should they take place during the winter), it is considered that this is unlikely to have a significant effect on the qualifying species of the SPA/ Ramsar site alone or in combination **Water quality** Although there are no watercourses within this allocation which could link into a European site, the allocation lies adjacent to the Dee Estuary and drainage ditches (within Flint Marsh) flow into the Estuary, and therefore there is the potential for construction site run off. However, given the short-term	**No LSE alone or in combination**

					nature of solar farm construction, in conjunction with the requirement to comply with standard CIRA guidance and Policy STR13 within the LDP, no likely significant effects on the water quality of the adjacent SPA/ Ramsar site/SAC are anticipated alone or in combination. Standard construction measures associated with development on landfill sites, will also be employed to protect the engineering cap on the existing landfill site and will therefore avoid likely significant effects associated with release of contaminants into the nearby Estuary. **NRW** Consultation with NRW has been carried out for this allocation. A project specific HRA is currently being produced which will provide further evidence to rule out likely significant effects associated with future development at this allocation.	
Policy EN25 - Sustainable Minerals Development						
Extension to Hendre Quarry (Limestone) Ref: EN25.1	Deeside and Buckley Newt Sites SAC (600m)	8.5ha	No recent planning history	New allocation boundary changed since UDP. The site comprises arable fields adjacent to the existing quarry site.	None anticipated	**No LSE alone or in combination**
Extension to Pant y Pwll Dwr Quarry (Limestone) Ref: EN25.2	Deeside and Buckley Newt Sites SAC (adjacent)	16.6ha	No recent planning history	New allocation boundary changed since UDP. The site comprises grassland and access route to existing quarry site.	None anticipated	**No LSE alone or in combination**
Extension to Ddol Uchaf Quarry (Sand and Gravel) Ref: EN25.3	No impact pathways to European sites identified	8.7ha	No recent planning history	New allocation boundary changed since UDP. The site comprises arable fields adjacent to the existing quarry site.	None anticipated	**No LSE alone or in combination**
Extension within Fron Haul Quarry (Sand and Gravel) Ref: EN25.4	No impact pathways to European sites identified	3ha	No recent planning history	New allocation boundary changed since UDP. The site comprises woodland and quarry tracks adjacent to the existing quarry site.	None anticipated	**No LSE alone or in combination**

6 In combination Effects (sites within the LDP)

6.1.1 The HRA needs to consider those elements of the LDP that may have a significant impact in combination either with other policies or sites within the LDP itself or with other plans and projects within the local area (or both). This Section looks at the potential in combination effects associated with allocations (and their associated policies) within the LDP itself. In combination effects associated with other plans or projects is set out within Section 7, below.

6.2 Policies and sites within the LDP

6.2.1 The policies set out within the Local Plan have been designed to work together (and should be read as such), there are no policies within the Local Plan which would act in combination with other policies with the Local Plan to have a likely significant effect on European sites either alone, or in combination.

6.2.2 The screening of the allocation sites set out within Table 20 identified the potential for in combination effects on the Dee Estuary SPA/ Ramsar site/ SAC in relation to an increase in recreational pressure on these European sites. All other potential in combination effects (within the Local Plan itself) have been screened out of further assessment.

Recreational pressure (Dee Estuary SPA/ Ramsar site)

6.2.3 The potential exists for a rise in visitor numbers to have a significant effect on the Dee Estuary SPA/Ramsar site as the housing and employment developments are progressively completed across Flintshire. The screening (refer to Table 20) identified six residential allocation sites within 3.5 km of the Dee Estuary. These are shown in Table 21. The table also shows the number of dwellings and the current planning status of each allocation site.

Table 21: New housing developments within 3.5 km of the Dee Estuary SPA/ Ramsar site/SAC

Allocation site	Number of Dwellings	Planning Status (Allocation (A) or Planning Permission Granted (PP)
Highmere Drive, Connah's Quay (Ref: HN1.3)	150	A
Northop Road, Flint (Ref: HN1.4)	170	A
Holywell Rd/Green Lane, Ewloe (Ref: HN1.7)	298	A
Ash Lane, Hawarden (Ref: HN1.8)	288	A
Warren Hall Mixed Use Development Site (Ref: STR3B)	300	A
Northern Gateway Mixed Use Development Site (Ref: STR3A)	1,300	PP
Number of allocations		**6**
Total number of dwellings		**2,506**

6.2.4 The LDP includes the delivery of 7,950 new homes across the plan period. Of these 2,506 (36%) are within 3.5 km of the Dee Estuary SPA/ Ramsar site/ SAC. The majority of these new homes will be delivered through the strategic sites at Warren Hill and the Northern Gateway (totalling 1,600 dwellings). These allocations have already gone through the planning system and have therefore

already had potential environmental impacts assessed through the planning application process (this did not identify recreational pressure as a potential impact on the Dee Estuary SPA/ Ramsar site/ SAC alone or in combination). For the remaining 906 new dwellings, these allocations are located in, or on the edge of urban areas with existing local amenities and recreational areas. Provision of public open space will be incorporated into all new housing developments (to comply with Policy EN1). This would further encourage residents to stay local, rather than travel to more distant European sites. Therefore, although the potential exists for an increase in visitors to the coast as the housing developments are progressively completed in Flintshire, it is not considered that there would be an increase which would be large enough such that it could have a significant effect on the European sites. This potential impact has therefore been **screened out** of further assessment.

6.3 Conclusion

6.3.1 The in-combination assessment of policies and allocations site within the LDP itself concludes that there are no likely significant in combination effects of implementing LDP.

7 In combination Effects (with other plans or projects)

7.1 Other Plans and Projects

7.1.1 In addition to in combination effects of sites within the LDP itself, there is the potential for effects to occur upon European sites in combination with other plans or projects.

7.1.2 Only the effects of other plans or projects which would not be likely to be significant alone, need to be included in the in-combination assessment. If the effects of other plans or projects will already be significant on their own, they are not added to those associated with the LDP as they already have their own measures in place to mitigate for those effects.

7.1.3 Table 11 below shows the plans and project reviewed for the in-combination assessment. NSIPs fall within Category C in accordance with DTA Publications Limited Handbook (Tyldesley D. and Chapman, C (2013) The Habitats Regulations Assessment Handbook (accessed July 2019) edition UK DTA Publications Limited www.dtapublications.co.uk). Separate project-level HRAs will be carried out for these projects, and appropriate mitigation and compensation will be put in place to off-set any potential impacts on European sites. Given that these projects would already be significant on their own, they will not be considered further in the in-combination assessment.

Table 22: Other Plans and Projects included within the in-combination assessment

Authority	Relevant Plan/ Project
Denbighshire	Denbighshire Local Plan (adopted in 2013)
Wrexham	Replacement Local Plan currently in preparation
Cheshire West and Chester	Local Plan Part One and Two (currently at Examination stage)
Wirral	Replacement Local Plan currently in preparation
Environment Agency	Dee River Basin District Flood Risk Management Plan 2015 – 2021
Flintshire County Council	Flintshire Local Flood Risk Management Strategy

7.1.4 To be relevant to the in-combination assessment, the residual effects of other plans or projects will need to be sufficient either to make the unlikely effects of the Local Plan likely, or insignificant effects of the plan significant, or both. An assessment has therefore been made of the other plans with a view to determining whether or not they would result in impacts which, in combination with the policies set out in the Local Plan, could have likely significant effects on European sites. This includes an assessment of whether any of the sites near the boundary of Flintshire would have any significant in combination effects with individual sites on the boundary of neighbouring boroughs.

7.1.5 A number of the local plans (as detailed in the following paragraphs), are currently being produced, under review, or are being updated. As it is not possible to review all of the information about these emerging Local Plans, the in-combination assessment will instead look at the information currently available in the public domain. Where recent Plan-level HRAs have been undertaken and are in the public domain (for example the emerging Denbighshire and Wrexham Local Plans) the HRA assessments (and associated documentation) have been reviewed as part of the in-combination assessment.

7.1.6 The in-combination assessment with all of the relevant plans (whether based on new or soon-to-be-replaced plans, as appropriate) is presented in the following paragraphs.

Denbighshire Local Plan

7.1.7 Denbighshire borders Flintshire to the west. The Denbighshire Local Plan (Denbighshire County Council, 2013) was adopted in 2013. A recent Review Report of the Local Plan highlighted the need for a replacement plan; however, there are no freely available details for the new plan, and as such, the existing adopted plan will be used in this in combination assessment. From information available online (including the Local Plan, proposals maps and conclusions of the Local Plan Examination) all of the new developments within Denbighshire are located adjacent to existing development and major roads. There are no allocation sites which would be at the boundary of the both districts, therefore, no significant in combination effects in respect of concurrent development at the border would occur. The HRA of the Local Plan concluded that '*an Appropriate Assessment is not required. It can therefore be concluded that no significant effects upon the integrity of the European sites within the county or in adjacent areas are likely to occur (either alone or in combination with other plans or projects) as a result of implementing the Plan*'. No residual effects were identified in the HRA and therefore there would be no in combination effects with the Flintshire Local Plan.

Wrexham Local Plan

7.1.8 Wrexham is located to the south of Flintshire. Wrexham County Borough Council is preparing the Local Development Plan (LDP) which will replace the current adopted Unitary Development Plan. From the information currently available online (including the draft LDP and HRA (Wrexham County Borough Council, 2017), new development within Wrexham will be focused on existing settlements within the borough. There are also no allocation sites which would be at the boundary of the both Flintshire and Wrexham, therefore, no significant in-combination effects in respect of concurrent development at the border would occur. The HRA of the Deposit Plan concluded that with mitigation in place, no residual effects were identified in the HRA and therefore there would be no in combination effects with the Flintshire Local Plan.

Cheshire West and Chester Local Plan

7.1.9 Cheshire West and Chester is located to the southeast of Flintshire. The Council has two Local Plans (Local Plan (Part One) Strategic Policies, adopted January 2015 and Local Plan (Part Two) Land Allocations and Detailed Policies (currently at Examination stage)). From the information currently available online (including the Local Plans, interactive mapping and HRAs (Cheshire West and Chester, accessed 2018) new development will be concentrated around Chester and existing urban areas within the district. There are no allocation sites which would be at the boundary of the both districts, therefore, there would be no significant in combination effects in respect of concurrent development at the border. The HRA of the Part One Local Plan concluded that '*the Cheshire West & Chester Local Plan comprises a sufficient a sufficient policy framework to enable the subsequent delivery of necessary measures that would avoid or adequately mitigate adverse effects on internationally designated sites and thus enable a conclusion of no adverse effect on integrity*.' The HRA of the Part Two Local Plan includes '*at a strategic level the measures that have been introduced are extensive changes to wording of individual policies to incorporate explicit protection of European sites, participation in the development of a visitor management strategy for the European sites around the Liverpool City Region in conjunction with those authorities and engagement with waste water infrastructure providers to confirm that they do not have significant concerns with the deliverability of the Local Plan (Part Two).*' Policy wording has also been incorporated into the plan to ensure no

adverse effect on European sites. With these measures in place, no residual effects were identified and therefore there would be no in combination effects with the Flintshire Local Plan.

Wirral Local Plan

7.1.10 Wirral is located to the northeast of Flintshire, across the Dee Estuary. The Council has two existing Local Plans (the Unitary Development Plan, February 2000 and the Joint Waste Local Plan for Merseyside and Halton, July 2013). The strategic polices in the Unitary Development Plan will be replaced by a new Core Strategy Local Plan (currently at the Development Options Review stage). From information currently available online for the emerging Core Strategy (including Policy Maps (Wirral Council, accessed 2018)), the large majority of the new housing and employment allocations are located to the northeast of the borough around Birkenhead and Bebington to the east of the M53 (more than 15 km from any proposed allocations within Flintshire), and are unlikely to have in combination effects with Flintshire Local Plan.

Dee River Basin Flood Risk Management Strategy and Flintshire Local Flood Risk Management Strategy

7.1.11 The Dee River Basin Flood Risk Management Strategy (Natural Resources Wales/ Environment Agency, 2016), and Flintshire Local Flood Risk Management Strategy (Flintshire County Council, 2013) set out how flood risk will be managed in the area. However, there are no elements of the Flood Risk Management Strategies which would act in combination with the Local Plan, and therefore has been screened out of the in-combination assessment.

7.2 Conclusion

7.2.1 The review of adjacent Local Plan information Local Plan Review information showed that there was no potential for in-combination effects between Flintshire and the neighbouring Local Plans. Therefore, potential in combination effects with other plans/ projects can be screened out of further assessment.

8 Overall Conclusion

8.1.1 This HRA Screening of the Flintshire Local Development Plan has considered the potential implications of the Plan for the European sites in the vicinity of the borough.

8.1.2 The Screening exercise concluded that none of the policies or associated allocation sites were considered to have a likely significant effect on any of the European sites alone, or in combination.

9 References

Cheshire West and Chester (accessed 2018). Cheshire West and Chester: Local Plan. http://inside.cheshirewestandchester.gov.uk/policies_plans_and_strategies/planning_policy/local_plan

Conservation of Habitats and Species (Amendment) Regulations (2017). SI 2017/1012: Explanatory memorandum to the Conservation of Habitats and Species Regulations, 2017.

Denbighshire County Council (2013). Denbighshire Local Plan, 2006-2021. https://www.denbighshire.gov.uk/en/resident/planning-and-building-regulations/local-development-plan/ldp-adopted-ldp/ldp-adopted-ldp.aspx

Tyldesley D. and Chapman, C (2013) The Habitats Regulations Assessment Handbook (accessed July 2019) edition UK DTA Publications Limited www.dtapublications.co.ukDTA Flintshire County Council (2013). Flintshire Local Flood Risk Management Strategy. Strategy Document. https://www.flintshire.gov.uk/en/PDFFiles/Flooding-and-Drainage/Flintshire-Local-Flood-Risk-Management-Strategy.pdf

Flintshire County Council (2018). Supplementary Planning Guidance 8a. Great Crested Newt Mitigation Requirements. https://www.flintshire.gov.uk/en/PDFFiles/Planning/SPG-8a-Great-Crested-Newt-Mitigation-Requirements.pdf

JNCC (2001). Dee Estuary SPA Description and Citation. http://jncc.defra.gov.uk/default.aspx?page=2053

JNCC (2011). Dee Estuary Ramsar Site Information Sheet and Citation. Version 3. http://jncc.defra.gov.uk/pdf/RIS/UK11082.pdf

JNCC (2015(a)). Dee Estuary SAC Site Description and Citation. http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUcode=UK0030131

JNCC (2015(b)). River Dee and Bala Lake SAC Site Description and Citation. http://jncc.defra.gov.uk/protectedsites/sacselection/SAC.asp?EUCode=UK0030252

JNCC (2015(c)). Deeside and Buckley Newt Sites SAC Site Description and Citation. http://jncc.defra.gov.uk/ProtectedSites/SACselection/sac.asp?EUcode=UK0030132

Natural England (2015). Site Improvement Plan: Dee Estuary/ Aber Dyfrdwy & Mersey Narrows (SIP056). http://publications.naturalengland.org.uk/publication/6579320399069184

Natural England (2014). Site Improvement Plan: River Dee and Bala Lake (SIP189). http://publications.naturalengland.org.uk/publication/5069340692971520

Natural Resources Wales (2008). Deeside and Buckley Newt Sites Special Area of Conservation Core Management Plan.

Natural Resources Wales/ Environment Agency (2016). Dee River Basin District Flood Risk Management Plan 2015 – 2021. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/507153/LIT_10199_DEE_FRMP.pdf

Welsh Assembly Government (2006). Annex to Technical Advice Note 5: Nature conservation and planning. The Assessment of Development Plans in Wales Under the Provision of The Habitats Regulations'.

Wirral Council (accessed 2018) Local Plan Policy Maps. https://www.wirral.gov.uk/planning-and-building/local-plans-and-planning-policy/local-plans/core-strategy-local-plan-6

Wrexham County Borough Council (2017). Wrexham Local Plan, 2013-2028. https://wrexham-consult.objective.co.uk/portal/ldp_ebsd

APPENDIX A

European Sites

Site Name	Qualifying Features	Pressures/ threats
Dee Estuary SPA	This site qualifies under **Article 4.1** of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **During the breeding season;** Common Tern *Sterna hirundo* Little Tern *Sterna albifrons* **On passage;** Sandwich Tern *Sterna sandvicensis* **Over winter;** Bar-tailed Godwit *Limosa lapponica* This site also qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: **On passage;** Redshank *Tringa totanus* **Over winter;** Black-tailed Godwit *Limosa limosa islandica* Curlew *Numenius arquata* Dunlin *Calidris alpina alpina* Grey Plover *Pluvialis squatarola* Knot *Calidris canutus* Oystercatcher *Haematopus ostralegus* Pintail *Anas acuta* Redshank *Tringa totanus* Shelduck *Tadorna tadorna* Teal *Anas crecca* **Assemblage qualification: A wetland of international importance.**	Public Access/ Disturbance; Changes in species distributions; Invasive species; Climate change; Coastal squeeze; Inappropriate scrub control; Water pollution; Fisheries: Commercial marine and estuarine; Inappropriate coastal management; Overgrazing; Direct impact from a third party; Marine litter; Predation; Planning permission: general; Marine consents and permits; Wildfire/ arson; Air pollution: impact of atmospheric nitrogen deposition; Transportation and service corridors; and Physical modification

Site Name	Qualifying Features	Pressures/ threats
	The area qualifies under **Article 4.2** of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl Over winter, the area regularly supports 130,408 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Black-tailed Godwit *Limosa limosa islandica*, Shelduck *Tadorna tadorna*, Teal *Anas crecca*, Pintail *Anas acuta*, Oystercatcher *Haematopus ostralegus*, Grey Plover *Pluvialis squatarola*, Bar-tailed Godwit *Limosa lapponica*, Dunlin *Calidris alpina alpina*, Sanderling *Calidris alba*, Curlew *Numenius arquata*, Redshank *Tringa totanus*, Cormorant *Phalacrocorax carbo*, Wigeon *Anas penelope*, Mallard *Anas platyrhynchos*, Lapwing *Vanellus vanellus*, Knot *Calidris canutus*.	
Dee Estuary SAC	**Annex I habitats that are a primary reason for selection of this site:** 1140 Mudflats and sandflats not covered by seawater at low tide 1310 Salicornia and other annuals colonizing mud and sand 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) **Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:** 1130 Estuaries 1210 Annual vegetation of drift lines 1230 Vegetated sea cliffs of the Atlantic and Baltic Coasts 2110 Embryonic shifting dunes 2120 "Shifting dunes along the shoreline with Ammophila arenaria (""white dunes"")" 2130 "Fixed coastal dunes with herbaceous vegetation (""grey dunes"")" 2190 Humid dune slacks **Annex II species that are a primary reason for selection of this site:** Not applicable **Annex II species present as a qualifying feature, but not a primary reason for site selection:** 1095 Sea lamprey *Petromyzon marinus* 1099 River lamprey *Lampetra fluviatilis*	As above.

Site Name	Qualifying Features	Pressures/ threats
	1395 Petalwort *Petalophyllum ralfsii*	
Dee Estuary Ramsar site	**Ramsar criterion 1:** Extensive intertidal mud and sand flats (20 km by 9 km) with large expanses of saltmarsh towards the head of the estuary. Habitats Directive Annex I features present on the pSAC include: H1130 Estuaries H1140 Mudflats and sandflats not covered by seawater at low tide H1210 Annual vegetation of drift lines H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts H1310 *Salicornia* and other annuals colonising mud and sand H1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) H2110 Embryonic shifting dunes H2120 Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") H2130 Fixed dunes with herbaceous vegetation ("grey dunes") H2190 Humid dune slacks **Ramsar criterion 2:** It supports breeding colonies of the vulnerable Natterjack Toad, *Epidalea calamita* **Ramsar criterion 5:** Assemblages of international importance: Species with peak counts in winter: Non-breeding season regularly supports 120,726 individual waterbirds (5 year peak mean 1994/5 – 1998/9). **Ramsar criterion 6:** Species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation): Species with peak counts in spring/autumn: Redshank, *Tringa totanus*, Species with peak counts in winter:	Refer to SPA/ SAC.

Site Name	Qualifying Features	Pressures/ threats
	Teal, *Anas crecca*, NW Europe Shelduck, *Tadorna tadorna*, NW Europe Oystercatcher, *Haematopus ostralegus*, Europe & W Africa Curlew, *Numenius arquata* Europe/NW Africa Pintail, *Anas acuta*, NW Europe Grey plover, *Pluvialis squatarola*, E Atlantic Knot, *Calidris canutus islandica*, W Europe/ Canada Dunlin, *Calidris alpina alpina* Europe (breeding) Black-tailed godwit, *Limosa limosa islandica*, Iceland (breeding) Bar-tailed godwit, Limosa lapponica , W European (wintering) Redshank, *Tringa totanus*, Eastern Atlantic Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm. Details of bird species occurring at levels of National importance are given in Section 22.	
River Dee and Bala Lake SAC	**Annex I habitats that are a primary reason for selection of this site:** 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation **Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:** Not applicable **Annex II species that are a primary reason for selection of this site:** Atlantic salmon *Salmo salar* 1831 Floating water-plantain *Luronium natans* **Annex II species present as a qualifying feature, but not a primary reason for site selection:** 1095 Sea lamprey *Petromyzon marinus* 1096 Brook lamprey Lampetra planeri 1099 River lamprey *Lampetra fluviatilis* 1163 Bullhead *Cottus gobio*	Pollution incidents arising from industrial and agricultural activity; Tourism; Fishing; Blue-green algal blooms, related to phosphate enrichment from the surrounding catchment; Alien/ introduced species; and water quality.

Site Name	Qualifying Features	Pressures/ threats
	1355 Otter *Lutra lutra*	
Deeside and Buckley Newt SAC	**Annex I habitats that are a primary reason for selection of this site:** Not applicable **Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:** 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles **Annex II species that are a primary reason for selection of this site:** 1166 Great crested newt *Triturus cristatus* **Annex II species present as a qualifying feature, but not a primary reason for site selection:** Not applicable	Loss of habitat due to agricultural intensification; pond senescence; and urban expansion; Non-native, invasive species; Recreational pressures (main pressures are fishing and off-roading); Predation; Barriers to movement; and Development.

APPENDIX B

Figures

Figure 1: Designated sites

APPENDIX C

Information from NE - Buffer distances in relation to European sites

Bird Group	Birds	Extent of Functional Habitat from site	Note
Birds 1	All breeding bird assemblages (excluding ground- nesting heathland species, stone-curlew, marsh harrier & nightjar)	**500m**	Breeding SSSI birds of prey (peregrine, merlin, hen harrier & honey buzzard) can also forage up to 4km. It is not thought likely, however, that these species would make significant use of farmland habitat beyond semi-natural areas encompassed by protected site boundaries.
Birds 2	All wintering birds (except wintering waders and grazing wildfowl; wigeon and geese)1,2	**500m**	Home ranges of dabbling ducks such as teal, mallard and gadwall could extend beyond site boundaries at coastal sites, but less likely to do so at inland water bodies. Where functional habitat of dabbling ducks does extend beyond site boundaries then this is likely to be accommodated by presence of wigeon, geese or waders. Wintering marsh harrier and hen harrier can forage 10s of km and are likely to make significant use of farmland habitat beyond semi-natural areas encompassed by site boundaries. Owing to extensive presence of farmland within 10s of km and low densities of birds, the standard distance of 500m relating to all wintering birds is deemed acceptable.
Birds 3	Wintering waders (except golden plover and lapwing), brent goose & wigeon1,3 marsh harrier[4,5]	**2km**	Breeding marsh harrier can also forage up to 4km and are likely to make significant use of farmland habitat beyond semi-natural areas encompassed by site boundaries. Owing to extensive presence of farmland and low densities of birds, a reduced distance of 2km is deemed acceptable.
Birds 4	Ground nesting heathland species, breeding nightjar & stone curlew	**2km**	Many sites (e.g. TBH/ Dorset Heaths) have issues of recreational disturbance. Buffers need to take into account travel to sites from proposed residential developments. Nightjar - up to 4km foraging distance for nightjars but unlikely to be >2km beyond site boundary. Likely to need site specific assessment as depending on adjacent land use there may be extensive or no functional habitat beyond the site boundary e.g. discrete heathland SSSI amongst grassland and woodland in comparison to discrete heathland site surrounded by development
Birds 5	Wintering lapwing and golden plover	**15-20km**	Golden plover can forage up to 15km from a roost site within a protected site. Lapwing can also forage similar distances. Both species use lowland farmland in winter, so difficult to distinguish between European populations and those present within the wider environment unconnected to a European site. Reduced sensitivity beyond 10km
Birds 6	Wintering white-fronted goose, greylag goose, Bewick's swan, whooper swan & wintering bean goose.	**10km**	No information
Birds 7	Wintering pink-footed goose, barnacle goose	**15-20km**	No information

Arcadis Consulting (UK) Limited

Arcadis Cymru House,

St. Mellons Business Park,

Fortran Road,

Cardiff,

CF3 0EY

arcadis.com

Appendix 2

NRW Site Specific Comments - PE1 Employment Allocations

Site	Comments
PE1.1 Manor Lane, Chester Aerospace Park, Broughton	The site lies within Zone C1 as defined by the DAM. The NRW Flood Risk Map confirms that the site lies entirely within the 0.1% (1 in 1,000) Annual Exceedance Probability (AEP) event flood outline. The proposed allocation would consist of employment (less vulnerable) development. It should be noted that a section of the site (the north-eastern portion) benefits from planning permission for employment development (planning reference 059221). We commented on this site in 2016 highlighting the flood risk to the site and that sites should not be proposed in the flood zone.
PE1.2 Manor Lane, Hawarden Park Extension, Broughton	The site lies partially within Zone C2 as defined by the DAM. Our Flood Risk Map confirms that the site lies partially within the 1% (1 in 100) and 0.1% (1 in 1,000) Annual Exceedance Probability (AEP) event flood outlines. The North Eastern edge of the site also lies just within flood zone C1. The proposed allocation would consist of employment (less vulnerable) development. We commented on this site in 2016 highlighting the flood risk to the site and that sites should not be proposed in the flood zone. Hawarden Park is highlighted as a red Recommendation B in the SCFCA.
PE1.4 Greenfield Business Park Phase I, Greenfield	The site lies within Zone C1 as defined by the DAM. Our Flood Risk Map confirms that the site lies entirely within the 0.5% (1 in 200) and 0.1% (1 in 1,000) Annual Exceedance Probability (AEP) event flood outline. The proposed allocation would consist of employment (less vulnerable) development. It should be noted that the Shoreline Management Plan (SMP) policy for Policy Unit 11a PU5.2 which covers the site is ‘managed realignment’ for Epochs 2 (50 years) and 3 (100 years).
PE1.5 Greenfield Business Park, Phase III, Greenfield	The site lies within Zone C1 as defined by the DAM. Our Flood Risk Map confirms that the site lies entirely within the 0.5% (1 in 200) and 0.1% (1 in 1,000) Annual Exceedance Probability (AEP) event flood outline.

	The proposed allocation would consist of employment (less vulnerable) development. It should be noted that the Shoreline Management Plan (SMP) policy for Policy Unit 11a PU5.2 which covers the site is 'managed realignment' for Epochs 2 (50 years) and 3 (100 years).
PE1.6 Broncoed Industrial Estate, Mold	The site lies partially within Zone C2 as defined by the DAM. Our Flood Risk Map confirms that the site lies partially within the 0.1% (1 in 1,000) Annual Exceedance Probability (AEP) event flood outline. The proposed allocation would consist of employment (less vulnerable) development. We understand the extent of this site has changed since our comments of 2016 on candidate sites to include areas within the flood zone C2.
PE1.8 Adjacent Mostyn Docks, Mostyn	The site lies partially within Zone C1 as defined by the DAM. Our Flood Risk Map confirms that the site lies partially within the 0.5% (1 in 200) and 0.1% (1 in 1,000) Annual Exceedance Probability (AEP) event flood outline. The proposed allocation would consist of employment (less vulnerable) development.
PE1.9 Chester Rd East, Queensferry	The site lies entirely within Zone C1 as defined by the DAM. The NRW Flood Risk Map confirms that the site lies entirely within the 0.5% (1 in 200) Annual Exceedance Probability (AEP) event flood outline. Your Authority's Strategic Flood Consequences Assessment (SFCA) also shows the site to be at risk when considering a breach event at Pentre and Queensferry, for the 0.5% AEP event, with an allowance for climate change. The proposed allocation would consist of employment (less vulnerable) development. It should be noted that there is a live planning application at the site for the siting of storage units, office accommodation and van hire, which is currently under consideration (planning reference 059947).
PE1.10 Antelope Industrial Estate, Rhydymwyn	The site lies entirely within Zone C2 as defined by the DAM. Our Flood Risk Map confirms that the site lies entirely within the 0.1% (1 in 1,000) Annual Exceedance Probability (AEP) event flood outline. The proposed allocation would consist of employment (less vulnerable) development.
PE1.12 Rowleys Drive, Shotton	The site lies entirely within Zone C1 as defined by the DAM. Our Flood Risk Map confirms that the site lies entirely within the 0.5% Annual Exceedance Probability (AEP) event flood outline.

	Your Authority's Strategic Flood Consequences Assessment (SFCA) also shows the site to be at risk when considering a breach event at Pentre and Queensferry, for the 0.5% AEP event, with an allowance for climate change. The proposed allocation would consist of employment (less vulnerable) development.

Appendix 3

Flintshire LDP Primary Employment Sites Flood Risk Appraisal

Draft Report

November 2020

www.jbaconsulting.com

Ty Dewi Sant
St Davids Park
Ewloe
Flintshire
CH5 3FF

JBA Project Manager

Mike Williamson
Mersey Bank House
Barbauld Street
Warrington
Cheshire
WA1 1WA

Revision History

Revision Ref/Date	Amendments	Issued to
P02, November 2020	Draft Report	Andy Roberts

Contract

This report describes work commissioned by Andy Roberts, on behalf of Flintshire County Council, by an email dated 6/10/20. Flintshire County Council's representative for the contract was Andy Roberts. Laura Thompson, Jack Pordham and Mike Williamson of JBA Consulting carried out this work.

Prepared by ..... Laura Thompson BSc

Technical Assistant

Prepared by ..... Jack Pordham BSc MA

Analyst

Reviewed by ..... Mike Williamson BSc MSc CGeog FRGS EADA

Principal Flood Risk Analyst

Purpose

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JBA Consulting has no liability regarding the use of this report except to Flintshire County Council.

Acknowledgements

JBA would like to thank representatives of Flintshire County Council and Natural Resources Wales for information provided to inform this assessment.

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Abbreviations

AEP	Annual Exceedance Probability
CC	Climate Change
CFB	Coastal Flood Boundary
DAM	Development Advice Map
FAA	Flood Alert Area
FCA	Flood Consequence Assessment
FCC	Flintshire County Council
FEH	Flood Estimation Handbook
FFL	Finished Floor Level
FWA	Flood Warning Area
FZ	Flood Zone
HFM	Historic Flood Map
LDP	Local Development Plan
LIDAR	Light Detection and Ranging
NRW	Natural Resources Wales
OS	Ordnance Survey
PE	Primary Employment
SFCA	Strategic Flood Consequence Assessment
SoP	Standard of Protection
SuDS	Sustainable Urban Drainage Systems
TAN	Technical Advice Note

1 Introduction

Following an update to Flintshire County Council's (FCC) Strategic Flood Consequence Assessment (SFCA) in October 2020, Natural Resources Wales (NRW) required additional flood risk screening assessments for eight Local Development Plan (LDP) Primary Employment sites (PE1) to enable inclusion in FCC's LDP.

NRW stated the following requirements at each site:

- Identification of the primary sources of flood risk and expected flood levels
- Recommendations for the design platform and finished floor levels and how feasible these levels are to achieve
- Recommendations on siting development (including for car parking and landscaped area) selectively within the site boundary, avoiding areas at greatest risk. For sites partially in a flood zone, ideally all development should be located outside of the flood outline
- Investigation into potential impacts on flood risk elsewhere and possible mitigation measures, if required.

This report contains flood risk screening assessments for each site identifying flood risk from multiple sources, recommendations for site layout and finished floor levels, and quantification of typical runoff and attenuation requirements to ensure there is no increase in flood risk elsewhere.

The purpose of this study is to confirm the suitability of development within identified areas and as such the focus is the avoidance of flood risk. The outcomes should improve the level of confidence in allocation and development suitability but will not provide any definitive mitigation measures. The outcomes from this screening study should inform more detailed site-specific Flood Consequence Assessments (FCA) at each site to accompany planning applications.

The table below summarises the outcomes from this flood risk screening appraisal.

Employment site	Suitability for allocation	Further work
PE1.1 Manor Lane, Chester Aerospace Park	Yes	FCA to confirm safe access/egress routes
PE1.2 Manor Lane, Hawarden Park Extension	Yes	FCA to confirm no development in watercourse blue/green corridor and safe access/egress routes either side of the watercourse
PE1.4 Greenfield Business Park Phase II	No	
PE1.5 Greenfield Business Park Phase III	No	
PE1.6 Broncoed Industrial Estate	Yes	FCA to confirm risk to site through further modelling
PE1.8 Adjacent Mostyn Docks	No	FCA to confirm risk to site through further modelling
PE1.10 Antelope Industrial Estate	Maybe. Significant risk from 0.1% AEP event though low risk from 1% AEP + climate change event	Consultation with NRW on acceptability
PE1.12 Rowley's Drive	No based on breaches	

2 PE1.1 Manor Lane, Chester Aerospace Park

PE1.1 Manor Lane, Chester Aerospace Park	
Location	Manor Lane, Chester Aerospace Park
Site area (ha)	5.7
Watercourse	Broughton Brook
NRW Model used	Broughton Brook 2014
Existing use	Mix of greenfield and brownfield – existing industrial units
Existing site flood risk vulnerability classification (TAN 15)	Less vulnerable
Proposed development flood risk vulnerability classification (TAN 15)	Less vulnerable
Proposed development impermeable area (ha) – *70% based on FCC advice*	4.04

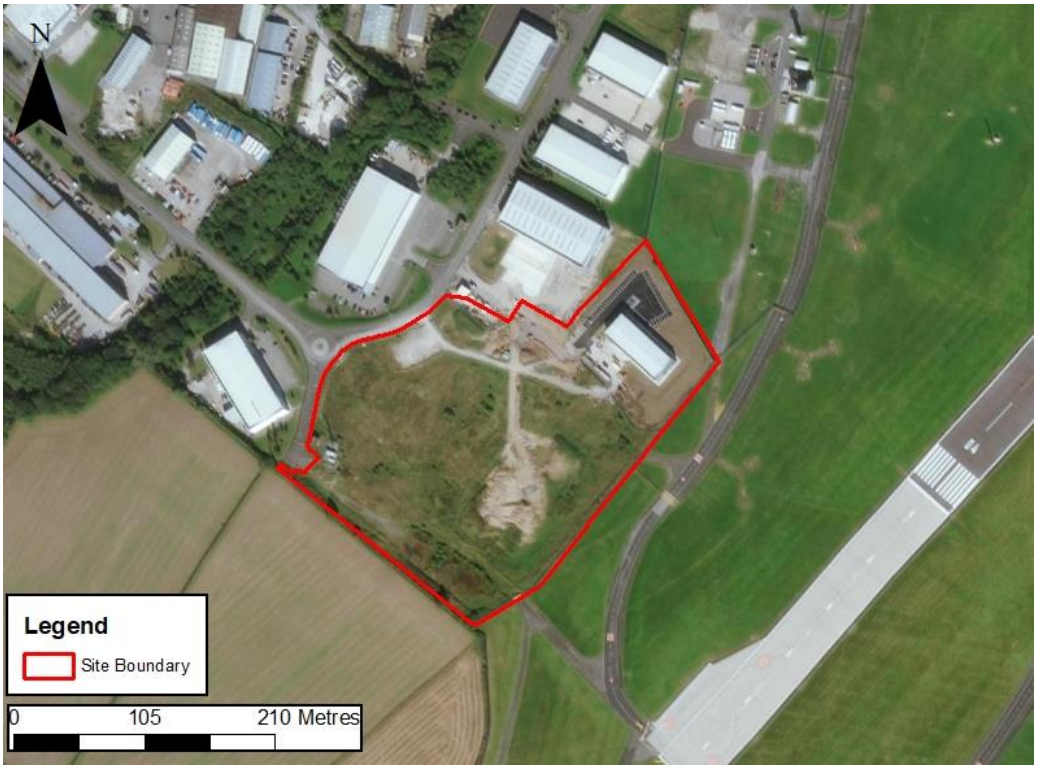

Figure 2-1 Aerial imagery of the site

PE1.1 Manor Lane, Chester Aerospace Park

Figure 2-2 Site boundary with 1m LIDAR

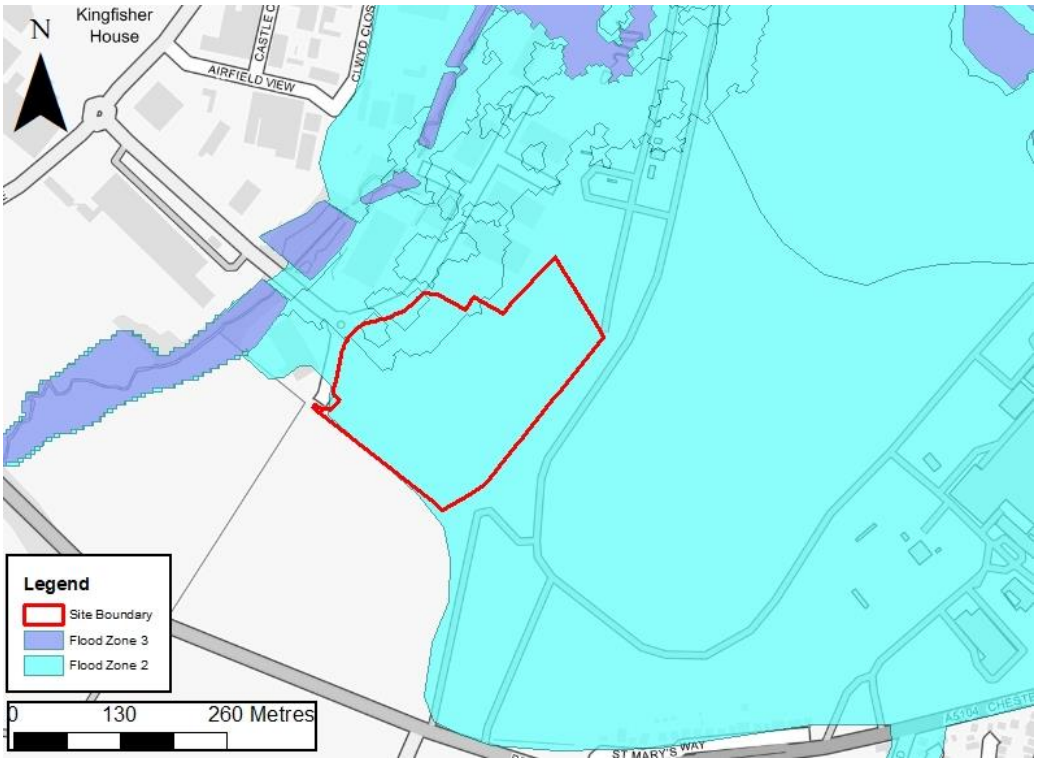

Figure 2-3 NRW Flood Zone mapping at site PE1.1

PE1.1 Manor Lane, Chester Aerospace Park

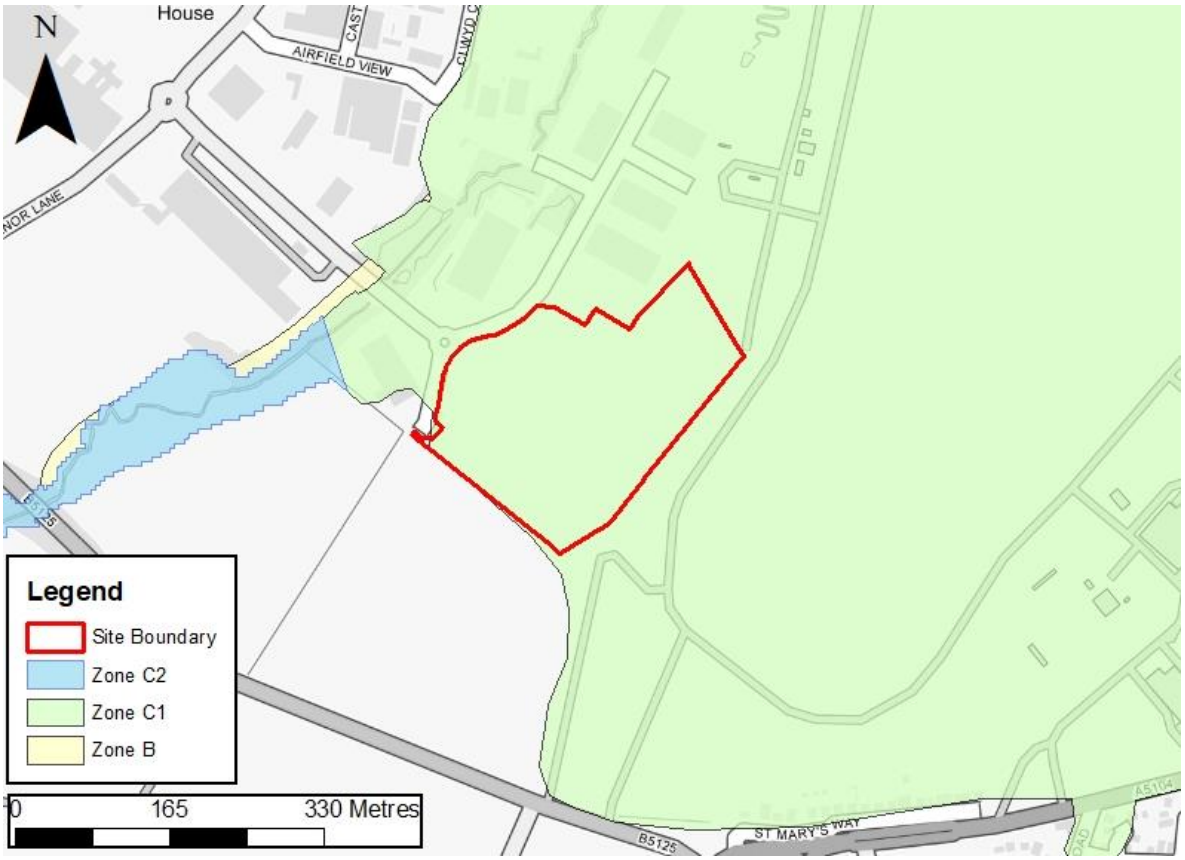

Figure 2-4 DAM mapping at site PE1.1

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Key findings from the 2020 Flintshire Strategic Flood Consequence Assessment (SFCA)

- Virtually the whole site is within DAM Zone C1 and Flood Zone 2
- Main source of fluvial risk is from Broughton Brook (including culvert blockage scenarios)
- Tidal risk from the River Dee in an undefended scenario. SFCA modelled defence breaches show very low risk to the site
- Nominal surface water risk
- TAN 15 advice: plan allocations and applications can only proceed subject to justification in accordance with Section 6 and acceptability of consequences in accordance with Section 7 and Appendix 1

PE1.1 Manor Lane, Chester Aerospace Park			
Modelled Flood Source: Fluvial			
Flood Zones (%)	Flood Zone 3	Flood Zone 2*	Climate Change**
	0	100	15
Fluvial: average depth (m)	n/a	n/a	0.1
Fluvial: maximum depth (m)	n/a	n/a	0.3
Fluvial: average hazard	n/a	n/a	Low
Fluvial: maximum hazard	n/a	n/a	Extreme
*Based on NRW Historic Flood Map not modelling **Based on Broughton Brook 2014 flood extents.			
Modelled fluvial risk including climate change on Broughton Brook	• Fluvial risk to the site, modelled from Broughton Brook, was shown to impact the site during the 0.1% AEP +CC event only, as shown below in Figure 2-5.		

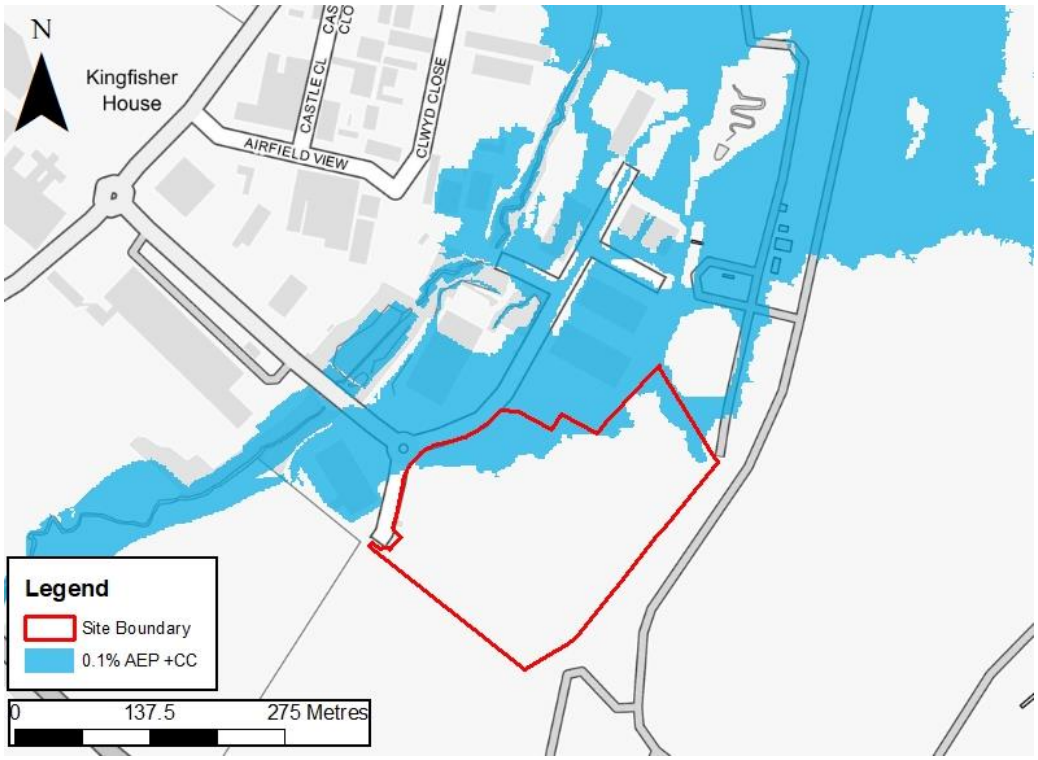
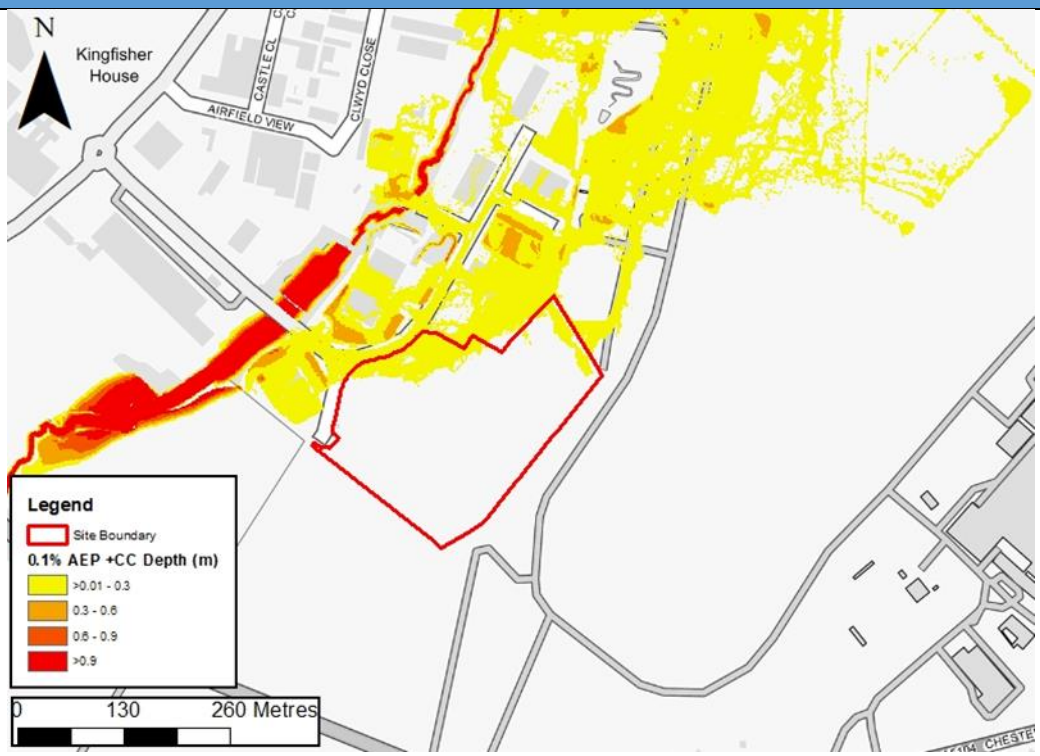


Figure 2-5 Modelled fluvial risk from Broughton Brook

- Figure 2-6 shows modelled depths to the site are low, being between >0.01-0.3m.
- Hazards to the site are on average classed as low though maximum values are extreme. These values are taken from the 0.1% AEP +CC modelled event.

PE1.1 Manor Lane, Chester Aerospace Park	
	 **Figure 2-6 Modelled fluvial depths to the site from Broughton Brook**
Modelled risk from SFCA culvert blockage (Broughton Brook)	• As part of the SFCA, blockage scenarios were additionally modelled on several Broughton Brook culverts. Two culverts were shown to impact on the site if blocked, namely the Flood Storage Outlet (SJ3379364728) and Manor Road (SJ3370664631). Both structures were modelled with medium/67% blockage proportions as per NRW guidance[1]. • Figure 2-7Figure 2- shows the modelled blockage extents for the 1% AEP + climate change event with the impact from the Flood Storage Outlet minimal. The Manor Road extent follows a similar trajectory to the modelled outlines (zero blockage) in Figure 2-5.

1 OGN100: Modelling Blockage and Breach Scenarios

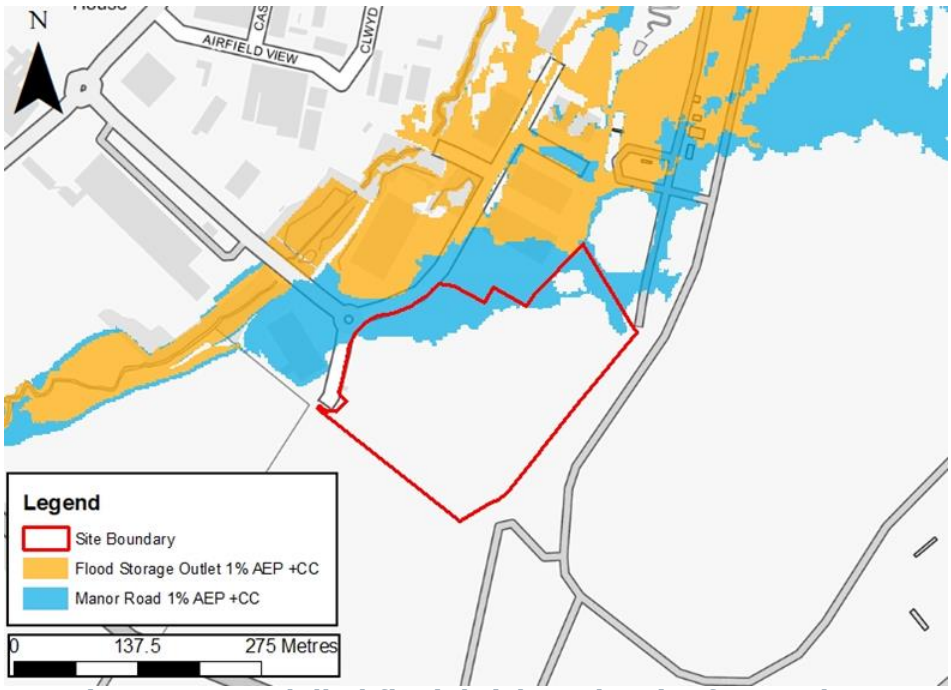


Figure 2-7 Modelled fluvial risk to the site from culvert blockages (67%) on Broughton Brook

- Flood depths are modelled to remain shallow in the Manor Road blockage scenario (see Figure 2-8 below)

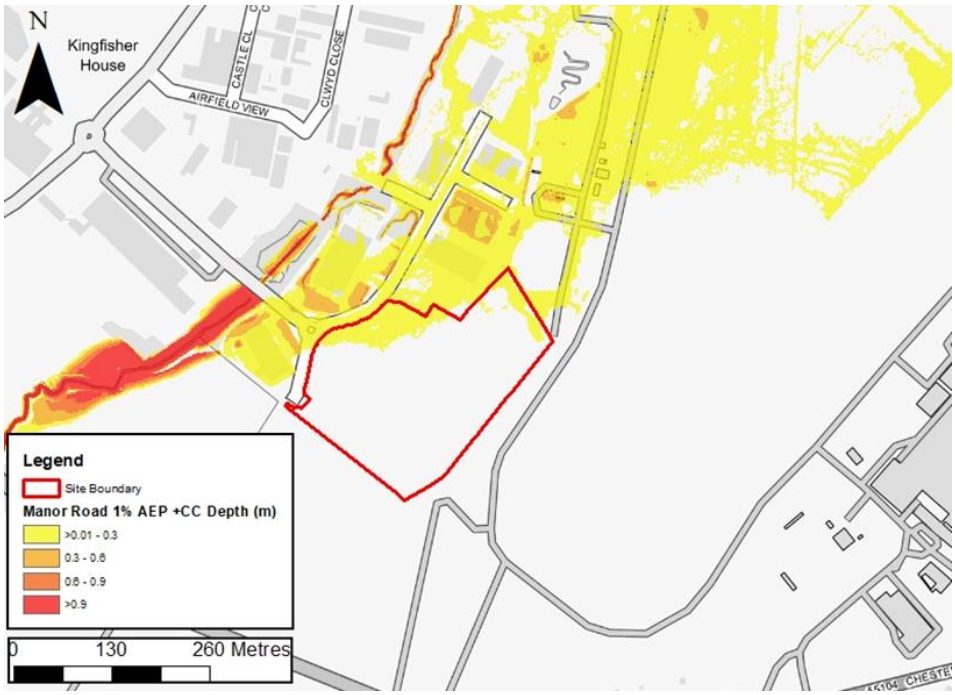
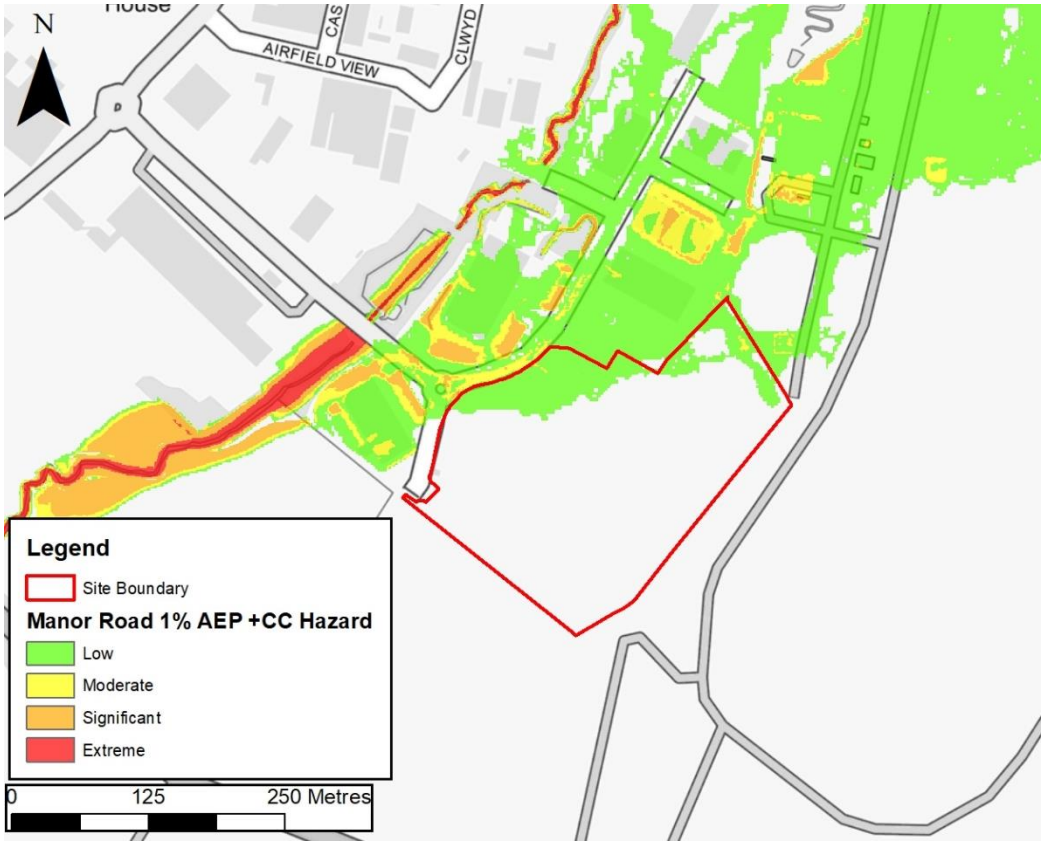


Figure 2-8 Modelled fluvial depths from Manor Road culvert blockage (67%) on Broughton Brook

PE1.1 Manor Lane, Chester Aerospace Park	
	 **Figure 2-9 Modelled flood hazards 2from Manor Road culvert blockage (67%) on Broughton Brook** • As with the flood depths, modelled hazards from the blockage scenario (Figure 2-9) to the site are on average classified as low and confined to the northern parts of the site.
Historic flooding	• The site lies within NRW's Historic Flood Map (HFM). The site is almost wholly within a historic flood event dating from January 1964 which appears to be the main source of Flood Zone 2.
Defences	• Based on NRW's Spatial Flood Defences dataset, there are no official defences bordering Broughton Brook near to the site. Along the banks of the River Dee there are embankments with condition ratings of 'poor' and Standards of Protection (SoP) of 200 years.
Flood Alert/Warning Area	• The site is almost entirely within an NRW Flood Alert Area, listed as 'areas along the North Wales coast from the Dee Estuary to the east coast of Anglesey'.
Observations, mitigation options & site suitability: fluvial	• **The site is almost entirely within Flood Zone 2 and DAM Zone C1 (99.7% in both). However, these flood zones do not account for the presence of defences on the River Dee.** • **The site is modelled to not be impacted by the SFCA tidal Dee defence breach scenarios.** • **Modelled fluvial risk from Broughton Brook shows the site is impacted**

2 Devised from FD2321/TR1. The Flood Risks to People Methodology. March 2006. Defra Flood and Coastal Defence R&D Programme

PE1.1 Manor Lane, Chester Aerospace Park	
	by flooding in both the baseline and blockage scenarios. However, the risk areas are confined to the northern boundaries of the site and do not propagate far into the site. • **Modelled depths and hazards are low, therefore, where ancillary uses cannot be directed to areas outside of the flood risk areas, it may be possible to site car parking, amenity green space to the risk areas.** • **Flood Zone 2 is based on a historic flood, identified in the HFM. Previous reporting from 2014[3] discussed the continued relevance of this outline to assessing current flood risk at this location. This is due to the general lack of information relating to the historic flood event and its age (i.e. changes to land use since 1964). Ideally, Flood Zone 2 should be based on hydraulic modelling.** • **It is clear from the above Figures 2-5 to 2-8; that the main development should be focused towards the centre of the site to avoid the fluvial flood risk from Broughton Brook.** • **The expected main access and egress routes from the north and west are modelled to flood from Broughton Brook in the 0.1% AEP baseline event and in the Manor Road culvert blockage scenario for the 1% AEP + climate change event. Though depths are generally seen to be low, alternative access points may have to be explored.**
Flood Source: Groundwater	
Flood risk: groundwater	• Due to the site's proximity to Broughton Brook, the groundwater levels are likely to be similar to the corresponding levels in the river. Groundwater follows topography and is unlikely to be a significant issue in this instance. • However, the FCA for the site should include an investigation into ground conditions and infiltrations capacities.

3 Broughton Brook Model Updates & FCA for Hawarden Business Park, JBA Consulting, 5th December 2014

PE1.1 Manor Lane, Chester Aerospace Park			
Flood Source: Surface Water			
Surface Water Flood Risk to Proposed Development Site			

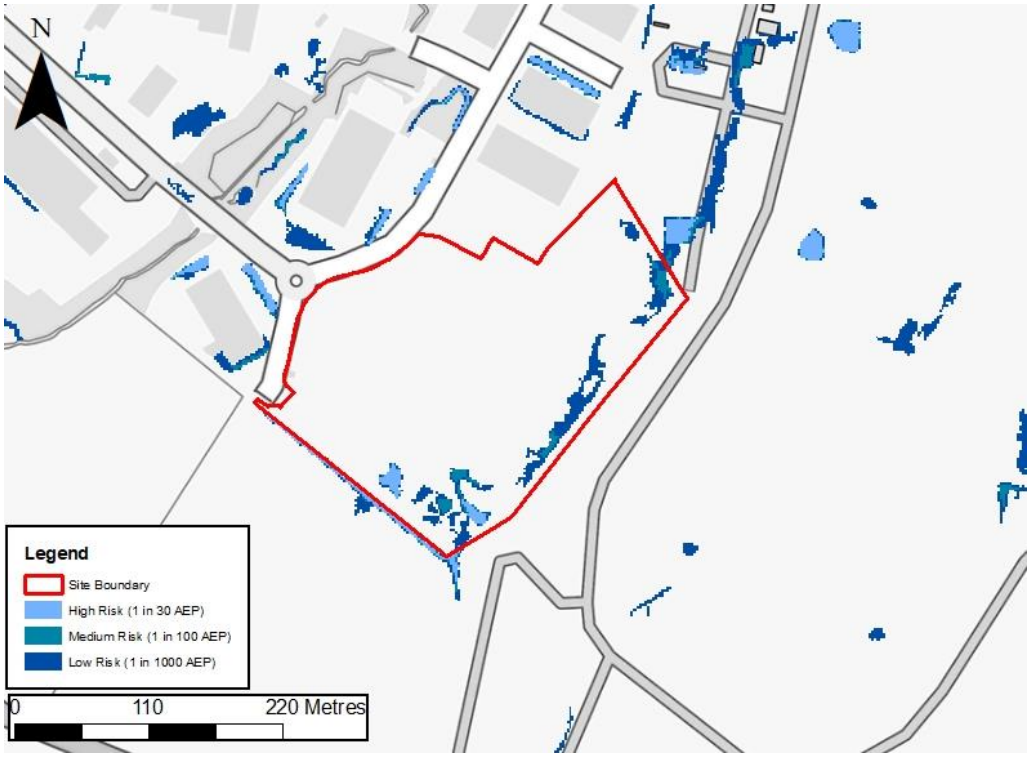


Figure 2-10 Surface water flood risk to site PE1.1 (NRW Risk of Flooding from Surface Water map)

Risk of Flooding from Surface Water map (%)	High Risk (1 in 30 AEP)	Medium risk (1 in 100 AEP)	Low risk (1 in 1000 AEP)
	0.8	1.4	9.2
Surface water flooding depths	Max: 0.54	Max: 0.56	Max: 0.59
Surface water hazards	Max: Significant Mean: Moderate	Max: Significant Mean: Moderate	Max: Significant Mean: Low
Surface water flood risk to development site	• Surface water risk to the site is shown to be generally low based on the national map with <1% of the site being within the high risk flood extent. Surface water risk is focused along the south-eastern boundary of the site, where there appears to be an offsite flow path from the road to the north of the site. There is a further flow path visible along the south western facing site boundary. • Surface water hazards at this site are on average moderate with the maximum values being classed as significant. All hazard ratings are provided in line with Defra guidance[4].		
Climate change	• In the absence of a modelled surface water climate change event, the current day 0.1% surface water outline provides an indication of the likely increase in extent of more frequent events.		
Mitigation options & site	• **The national Risk of Flooding from Surface Water is not suitable for providing site-specific advice. The FCA should there investigate**		

4 Table 4.2, pg 42, Flood Risks to People Phase 2, FD2321 Guidance Document, Defra

suitability: surface water	**surface water risk further through an outline drainage strategy.** • **Any proposed development should look to avoid the 1% AEP outline. Similar as with the fluvial risk, development should be prioritised towards the centre of the site.** • **The surface water flow paths should be effectively managed through appropriate SuDS measures, i.e. swales, incorporation of a blue-green corridor and not developed on. Ideally, natural flow paths should be left to flow and remain free of obstruction. The inclusion of these flow paths in the site layout should be investigated at the site design stage.** • **As the site is currently greenfield, the feasibility of infiltration SuDS should also be explored. Contamination testing would also be required.**

Surface Water Flood Risk from Proposed Development

Proposed development limiting runoff rate in accordance with G2.30 of Welsh SuDS Standards: (l/sec)
Qbar: 20 l/s (FEH Statistical)

Design flood event (incl climate change)	Critical storm duration Hrs	Inflow volume m^3	Outflow volume m^3	Attenuation required m^3	Time to empty (assuming no infiltration) Hrs	Total detention basin storage required: Area (ha) of unlined base and depth (m)
30yr Rainfall+20%	12	3532	605	2927	57.9	0.97 ha 0.30 m
30yr Rainfall+40%	12	4121	605	3516	69.6	0.97 ha 0.36 m
100yr Rainfall+20%	12*	4626	605	4021 (1094m3 of exceedance storage)	79.6	0.97 ha 0.41 m
100yr Rainfall+40%	12*	5397	605	4792 (1276m3 of exceedance storage)	94.8	0.97 ha 0.49 m

*limited to corresponding 30yr Rainfall critical storm duration

Climate change	• Application of the central (20%) and upper band (40%) potential change anticipated for climate change in the table above shows the estimated attenuation volumes for the 1% AEP and 3.33% AEP rainfall events.
Surface water: flood risk impacts from development site, mitigation & SuDS	• As part of this appraisal, we have included calculations to provide an estimated land take if a detention basin is used to attenuate runoff. In accordance with Table G2.1 of Welsh SuDS Standards, the drained impermeable surface area (assumed 85%) should be less than 5 times the vegetated surface area receiving the runoff. This is equivalent to 17% of the total site. • This provides a high land take estimate. Where infiltration rates are greater than 1x10-6m/s, areas up to 25 times the base area of the basin can be assumed to meet interception requirements. • Further reductions in land take can be achieved by adopting a Long-Term Storage approach (SuDS Standards: G2.30), or through design of green roofs,

PE1.1 Manor Lane, Chester Aerospace Park	
	rainwater harvesting systems and infiltration where appropriate. It is noted that contamination issues could preclude an unlined basin. • Attenuation volumes are presented for the critical storm duration for the 1 in 30-year events with exceedance flows quantified up to the 1 in 100-year event. To prevent development worsening flood risk elsewhere, surface water runoff must be managed on site.
Overall Site Assessment	
Development suitability	• **As the site is within DAM Zone C1, the justification test (Section 6, TAN 15) needs to be applied with the potential consequences of flooding to the site occurring being accepted. Appendices A1.14 and A1.15 of TAN 15 provide indicative guidance on acceptable thresholds for employment (commercial/retail) use.** • **In accordance with Table A1.14 of TAN 15, the development would be expected to be designed to be flood free up to the fluvial 1% AEP + climate change event for the Manor Road culvert blockage scenario on Broughton Brook.** • **Fluvial risk from Broughton Brook is mainly confined to the northern boundary of the site with the majority of surface water risk confined to flow paths along the south eastern and south western boundaries.** • **Given the confinement of risk, development is likely to be suitable at this location. The main development should be prioritised away from the risk areas and towards the central and western areas of the site. If required, the areas at risk could be used for ancillary uses, i.e. as car parking or open green space though NRW would advise that flood depths should not exceed 300mm and the hazard rating should remain "very low" in accordance with the established DEFRA FD2320 Hazard Guidance.** • **The FCA should investigate alternative access and egress routes, given the flood risk to the roads to the north and west of the site.** • **As the majority of the site is shown to be at very low risk, it is assumed that development at this site would not adversely affect flood risk elsewhere, assuming development can avoid the risk area which at this stage appears possible.** • **Given the site is within Zone C1, confirmation on the condition, reliability and future maintenance arrangements for the Dee defences should be sought from NRW.** • **The FCA will need to include an assessment of ground conditions and suitability for infiltration SuDS through a hydrogeological investigation.**

3 PE1.2 Manor Lane, Hawarden Park Extension

PE1.2 Manor Lane, Hawarden Park Extension	
Location	Manor Lane, Hawarden Park Extension
Site area (ha)	17.8
Watercourse	Broughton Brook
NRW Model used	Broughton Brook 2014
Existing use	Greenfield
Existing site flood risk vulnerability classification (TAN 15)	Not classified - open green space
Proposed development flood risk vulnerability classification (TAN 15)	Less vulnerable
Proposed development impermeable area (ha) – *70% based on FCC advice*	12.5

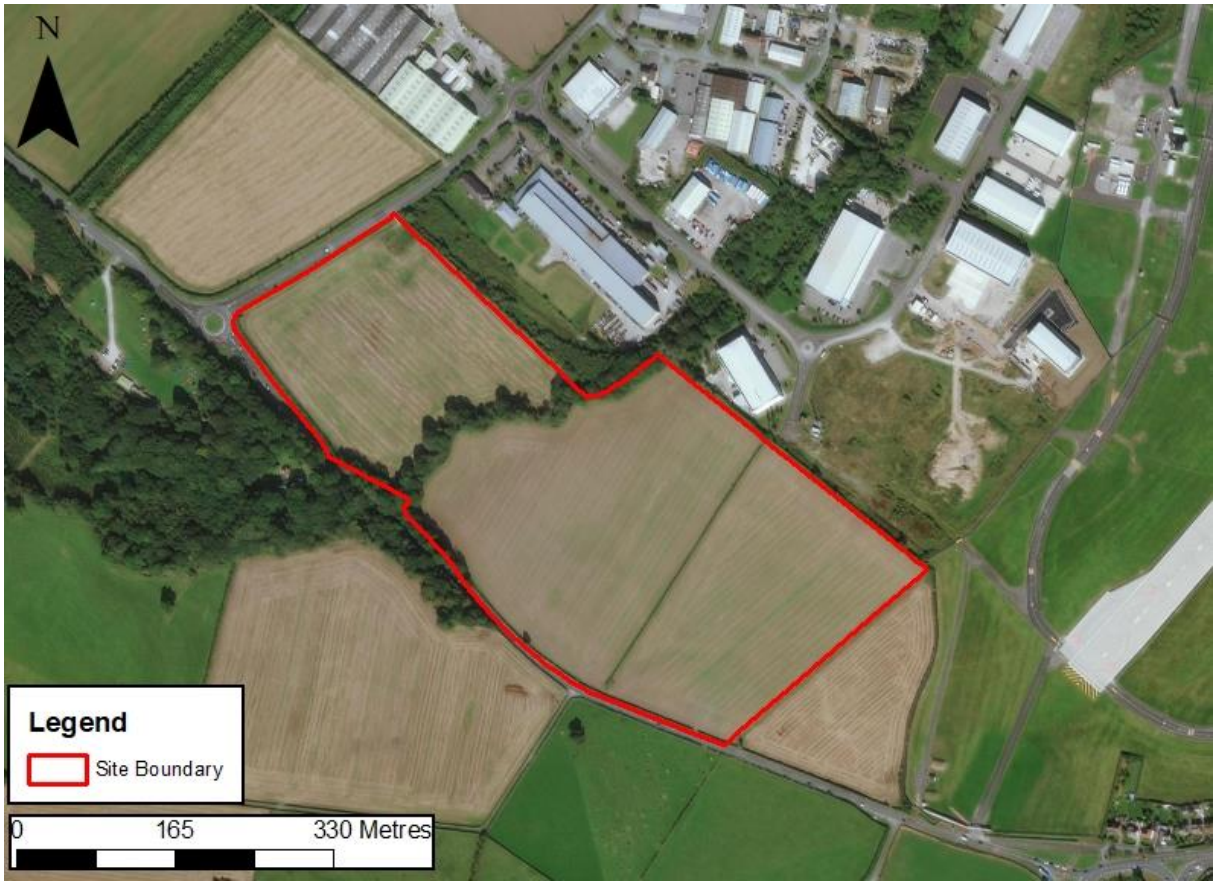


Figure 3-1 Aerial imagery of the site

PE1.2 Manor Lane, Hawarden Park Extension

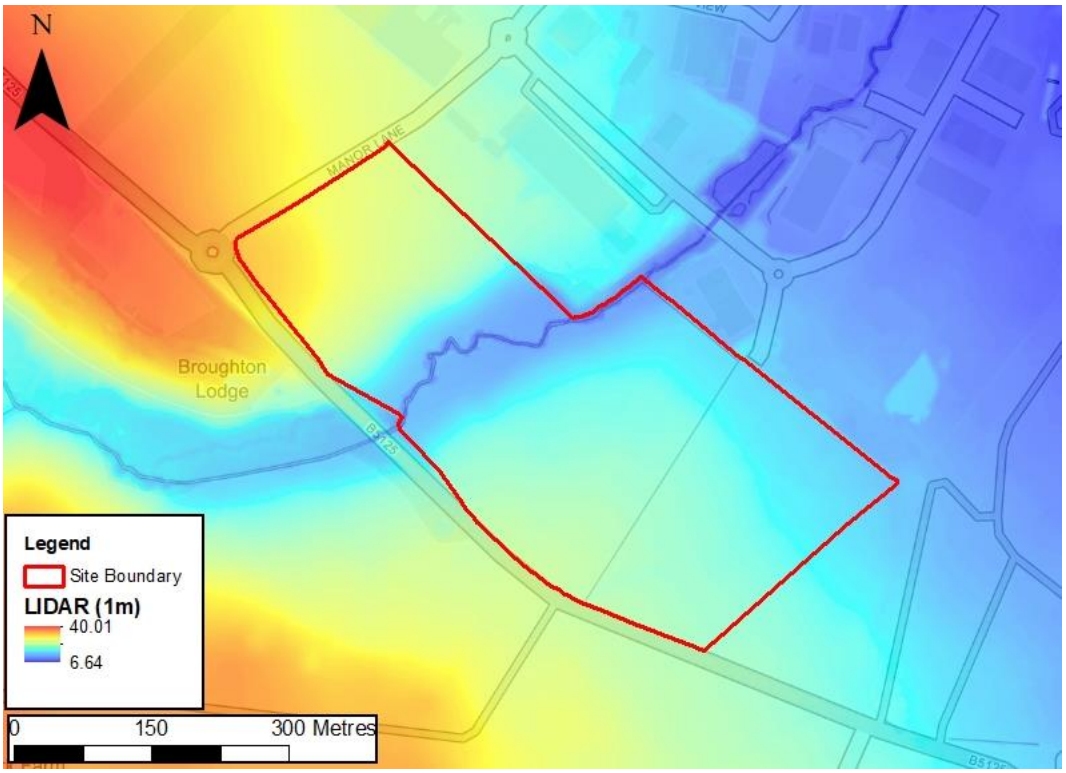


Figure 3-2 Site boundary with 1m LIDAR

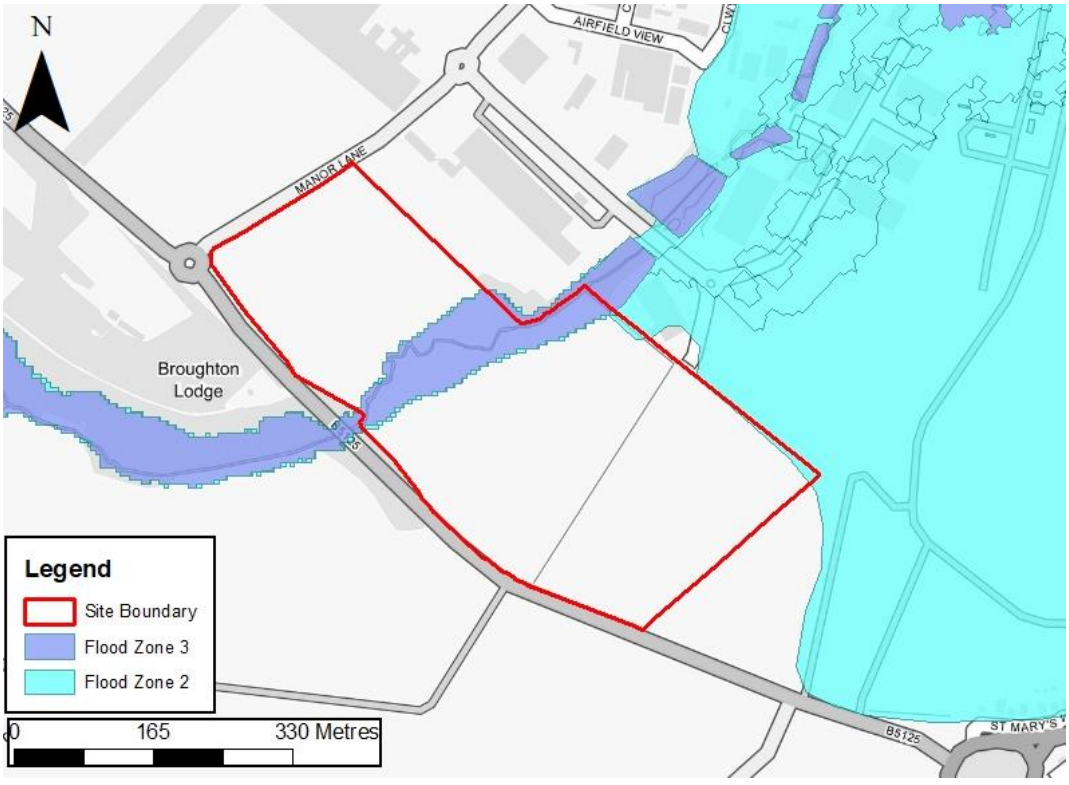


Figure 3-3 NRW Flood Zone mapping at site PE1.2

PE1.2 Manor Lane, Hawarden Park Extension

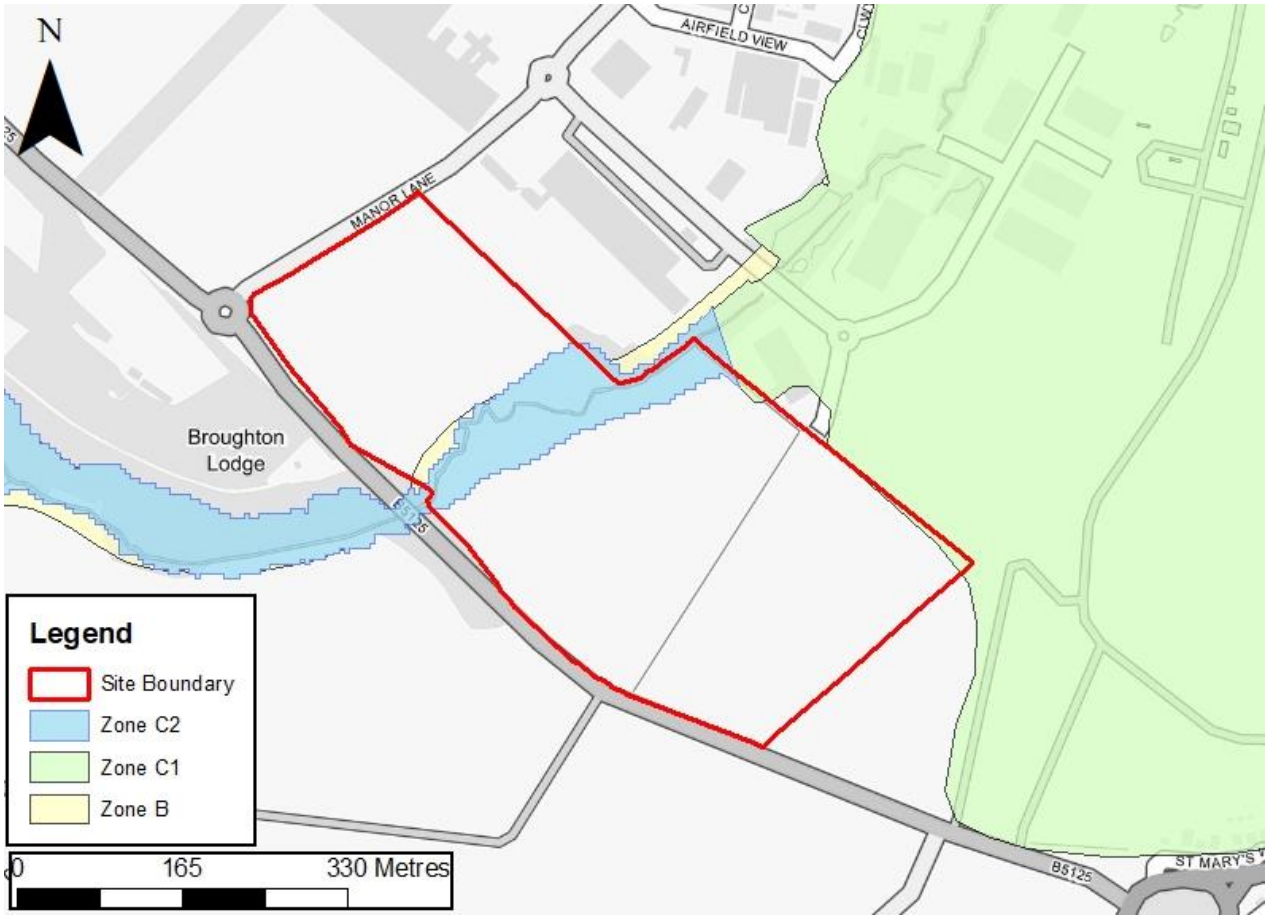


Figure 3-4 DAM mapping at site PE1.2

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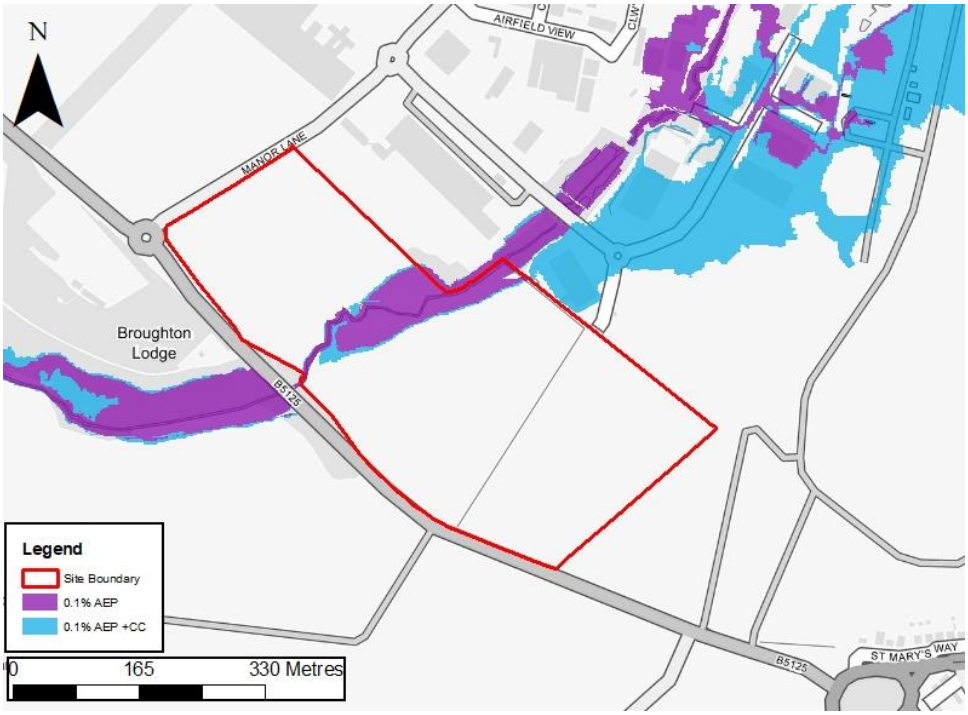
Key findings from the 2020 Flintshire Strategic Flood Consequence Assessment (SFCA)

- The site is 89% in DAM Zone A, 10% in DAM Zone C2 and 9% in Flood Zone 3.
- Main source of fluvial risk is from Broughton Brook running directly through the centre of the site (including culvert blockage scenarios)
- Tidal risk from the River Dee in an undefended scenario. SFCA modelled defence breaches show very low risk to the site
- Nominal surface water risk
- TAN 15 advice: plan allocations and applications can only proceed subject to justification in accordance with Section 6 and acceptability of consequences in accordance with Section 7 and Appendix A
- The whole site previously benefitted from outline planning permission (040732) which was last renewed on 28/05/12 (050673) by Welsh Government (to allow further time for submission of reserved matters). A press release in August 2020 indicated that Welsh Government had reached agreement with a developer, Redsun Properties, to develop 60,000sq ft of industrial/logistic space with a view to submitting a planning application. The proposal relates to the parcel of land to the

PE1.2 Manor Lane, Hawarden Park Extension			
west of Broughton Brook only.			
Modelled Flood Source: Fluvial*			
Flood Zones (%)	Flood Zone 3	Flood Zone 2	Climate Change
	9	11	8
Fluvial: average depth (m)	0.8	1.0	1.0
Fluvial: maximum depth (m)	2.0	4.5	2.7
Fluvial: average hazard	Significant	Significant	Extreme
Fluvial: maximum hazard	Extreme	Extreme	Extreme
*Based on Broughton Brook 2014 flood extents.			
Modelled fluvial risk including climate change on Broughton Brook	• Fluvial risk to the site, modelled from Broughton Brook (flowing west to east), is shown to impact the site during both the 0.1% AEP and 0.1% AEP +CC events. Modelled fluvial risk is shown to be low, with extents only affecting the riparian zones of Broughton Brook in the largest events, as shown in Figure 3-5. • It is noticeable that offsite risk increases significantly with climate change to the industrial area to the north east. • Modelled fluvial risk to the site during the 1% AEP and 1% AEP +CC events is constrained to the channel.  **Figure 3-5 Modelled fluvial risk from Broughton Brook** • Figure 3-6 indicates that flood depths to the site are highest in the immediate area surrounding Broughton Brook, with depths as high as		

1.6m, which reduce as you move further away from the channel, as expected.

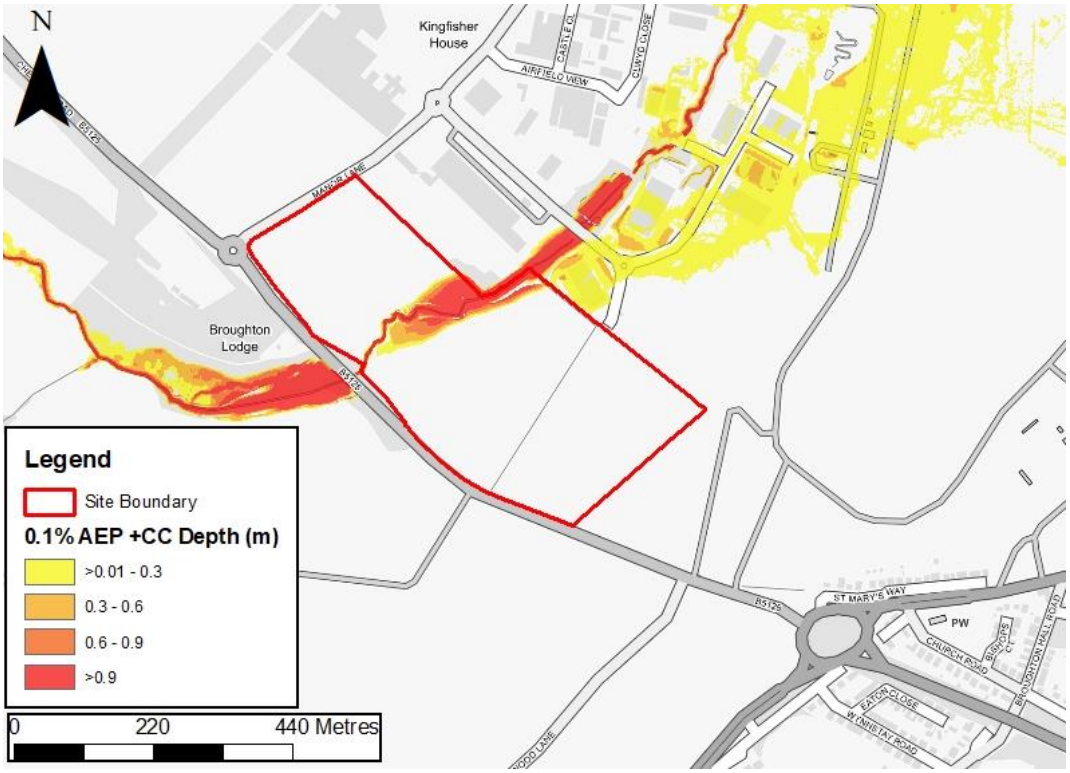
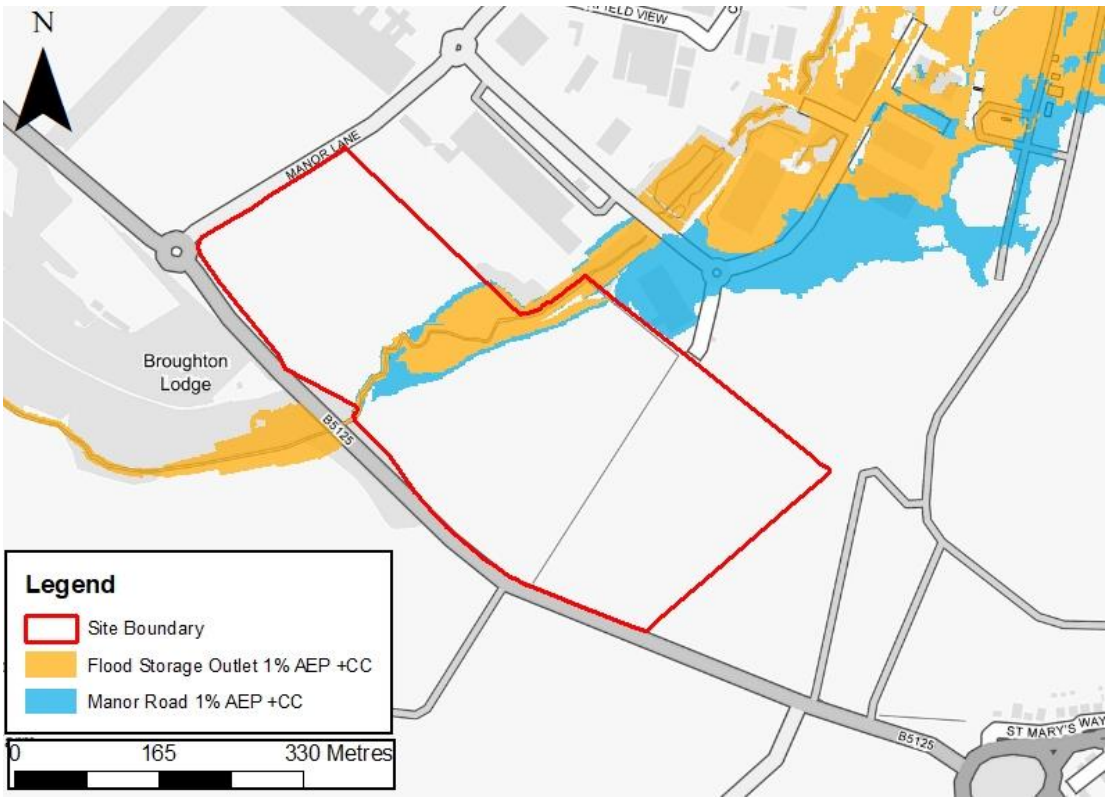


Figure 3-6 Modelled fluvial depths to the site from Broughton Brook

Modelled risk from culvert blockage (Broughton Brook)	• As part of the SFCA, blockage scenarios were additionally modelled on several Broughton Brook culverts. Two culverts were shown to impact on the site if blocked, namely the Flood Storage Outlet (SJ3379364728) and Manor Road (SJ3370664631). Both structures were modelled with medium/67% blockage proportions as per NRW guidance. • Two other SFCA blockage scenarios modelled on Broughton Brook, at Chester Road and Airfield View Lane, also impact the site. However, risk is modelled to remain within the channel. • Figure 3-7 shows the modelled blockage extents for the 1% AEP + climate change event for both culverts. The modelled extents follow a similar course to the modelled outlines (zero blockage) shown in Figure 3-5.

PE1.2 Manor Lane, Hawarden Park Extension	
	 **Figure 3-7 Modelled fluvial risk to the site from culvert blockages (67%) on Broughton Brook** • It can be seen on Figure 3-8 that depths resulting from culvert blockages are modelled to be similar to the unblocked baseline depths

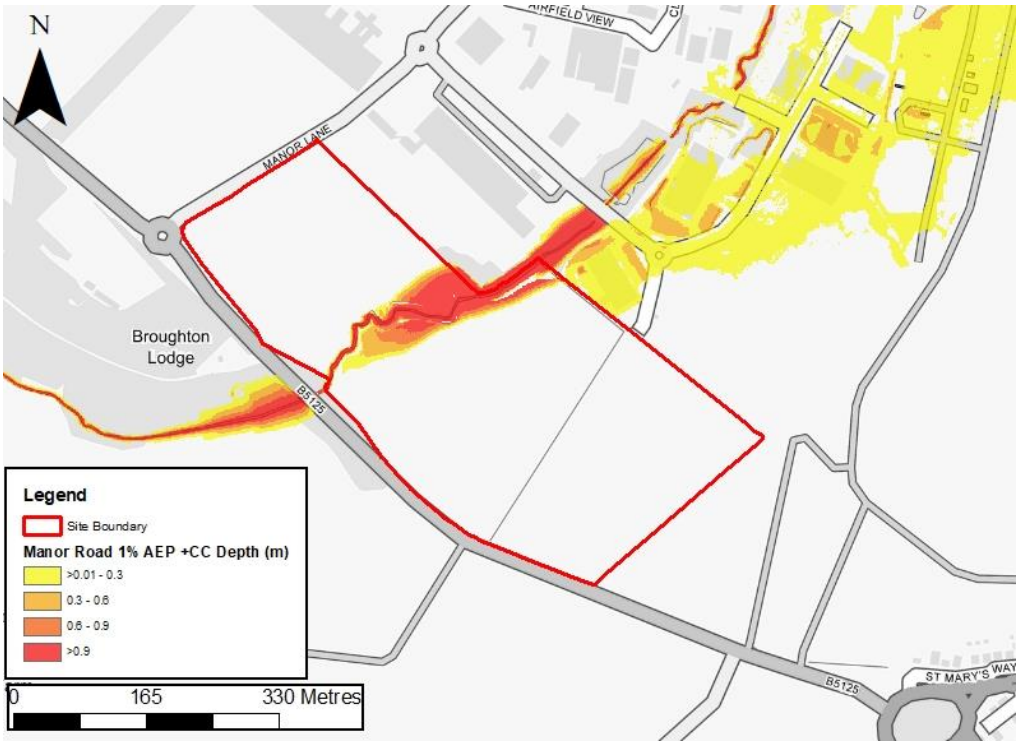


Figure 3-8 Modelled fluvial depths from Manor Road culvert blockage (67%) on Broughton Brook

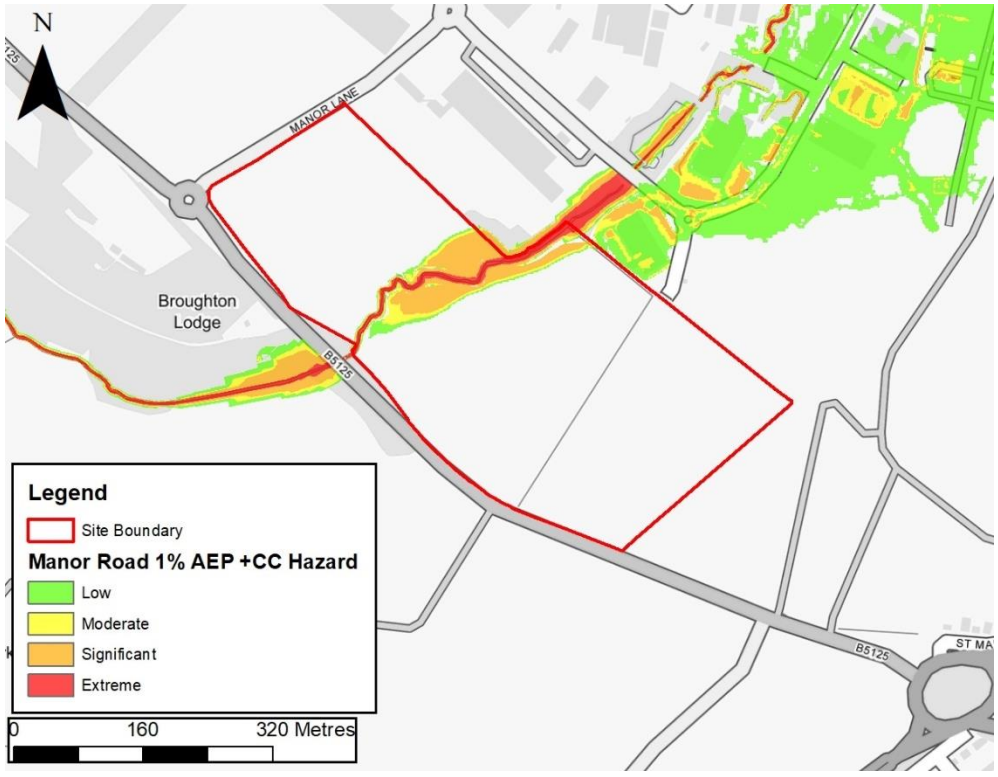


Figure 3-9 Modelled fluvial hazards from Manor Road culvert blockage (67%) on Broughton Brook

- Modelled flood hazards from the Manor Road culvert blockage range from moderate to extreme classifications though the latter exists only within

PE1.2 Manor Lane, Hawarden Park Extension	
	channel. The land on either side of the channel is shown to be at significant risk with this reducing further west.
Historic flooding	• The site lies outside areas included in NRW's Historic Flood Map (HFM). There are sections along the eastern boundary of the site that are slightly within the HFM, based on a historic event dating from January 1964.
Defences	• Based on NRW's Spatial Flood Defences dataset, there does not appear to be any manmade defences on Broughton Brook that may influence risk to the site. Along the banks of the River Dee there are embankments with condition ratings of 'poor' and Standards of Protection (SoP) of 200 years.
Flood Alert/Warning Area	• There are sections along the eastern boundary of the site that are slightly within an NRW Flood Alert area, listed as 'areas along the North Wales coast from the Dee Estuary to the east coast of Anglesey'. The majority of the site is not within a NRW Flood Alert or Flood Warning Area.
Observations, mitigation options & site suitability: fluvial	• **The risk primarily remains confined to the riparian areas of Broughton Brook with the majority of the site at very low risk in Flood Zone 1 and DAM Zone A. This is also the case for the modelled culvert blockages. It should therefore be possible for development to be preferentially sited away from the fluvial risk areas.** • **The site is also modelled to not be impacted by the SFCA tidal Dee defence breach scenarios.** • **Safe access/egress routes can be achieved via Manor Lane to the north west and the B5125 to the south.** • **NRW would require that development account for a 8m access/maintenance buffer along Broughton Brook. This buffer should be extended to cover the risk areas by way of a blue green corridor whereby conveyance of water should be maintained.** • **Site design should look to avoid any further culverting of Broughton Brook as a means of connecting the site from east to west. In terms of limiting flood risk, the preference would be for two site access points either side of Broughton Brook.**
Flood Source: Groundwater	
Flood risk: groundwater	• Due to the site's proximity to Broughton Brook, the groundwater levels are likely to be similar to the corresponding levels in the river. Groundwater follows topography and is unlikely to be a significant issue in this instance. • However, the FCA for the site should include an investigation into ground conditions and infiltrations capacities.

PE1.2 Manor Lane, Hawarden Park Extension			
Flood Source: Surface Water			
Surface Water Flood Risk to Proposed Development Site			

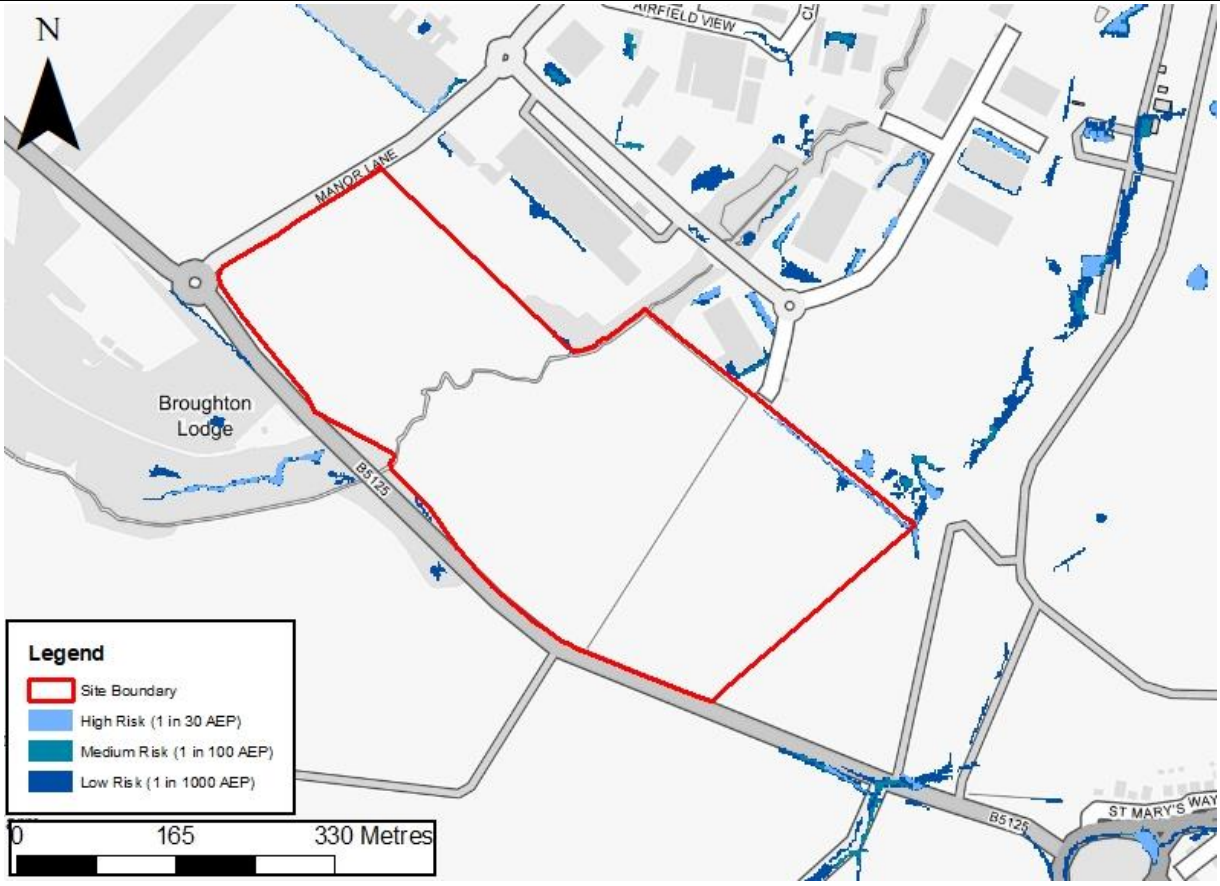


Figure 3-10 Surface water risk to site PE1.2 (NRW Risk of Flooding from Surface Water map)

Existing development: Risk of Flooding from Surface Water map (%)	High Risk (1 in 30 AEP)	Medium risk (1 in 100 AEP)	Low risk (1 in 1000 AEP)
	1.26	1.52	2.37
Surface water flooding depths	Max: 0.6	Max: 0.6	Max: 0.7
Surface water hazards	Max: 1.3 Mean: 0.94	Max: 1.34 Mean: 0.96	Max: 1.45 Mean: 0.96
Surface water flood risk to development site	• Surface water risk to the site is shown to be generally very low based on the national map with <1% of the site being within the high-risk area. The surface water risk is focused along the eastern boundary of the site. Although the extent of this is minimal, any development would be advised to be preferentially sited away from this area.		
Climate change	• The current day 0.1% surface water outline provides an indication of the likely increase in extent of more frequent events. This indicates a similar risk of surface water flooding as the current high-risk areas, occurring along the eastern boundary of the site, so proposed development should avoid these areas.		

PE1.2 Manor Lane, Hawarden Park Extension						
Mitigation options & site suitability: surface water	• **The national Risk of Flooding from Surface Water is not suitable for providing site-specific advice. The FCA should there investigate surface water risk further through an outline drainage strategy** • **Any proposed development should look to avoid the 1% AEP outline. Development should be prioritised away from the eastern boundary of the site. The risk to the site from surface water flooding is low.**					
Surface Water Flood Risk from Proposed Development						
Proposed development limiting runoff rate in accordance with G2.30 of Welsh SuDS Standards: (l/sec) Qbar: 20 l/s (FEH Statistical)						
Design flood event (incl climate change)	Critical storm duration Hrs	Inflow volume m^3	Outflow volume m^3	Attenuation required m^3	Time to empty (assuming no infiltration) Hrs	Total detention basin storage required: Area (ha) of unlined base and depth (m)
30yr Rainfall+20%	12	10988	1875	9113	58.2	3.03 ha 0.30 m
30yr Rainfall+40%	12	12819	1875	10944	69.9	3.03 ha 0.36 m
100yr Rainfall+20%	12*	14390	1875	12515 (3402m3 of exceedance storage)	79.9	3.03 ha 0.41 m
100yr Rainfall+40%	12*	16788	1875	14914 (3970m3 of exceedance storage)	96.3	3.03 ha 0.49 m
*limited to corresponding 30yr Rainfall critical storm duration						
Climate change	• Application of the central (20%) and upper band (40%) potential change anticipated for climate change in the table above shows the estimated attenuation volumes for the 1% AEP and 3.33% AEP rainfall events.					
Surface water: flood risk impacts from development site, mitigation & SuDS	• As part of this appraisal we have included calculations to provide an estimated land take if a detention basin is used to attenuate runoff. In accordance with Table G2.1 of Welsh SuDS Standards, the drained impermeable surface area (assumed 85%) should be less than 5 times the vegetated surface area receiving the runoff. This is equivalent to 17% of the total site. • This provides a high land take estimate. Where infiltration rates are greater than 1x10-6m/s, areas up to 25 times the base area of the basin can be assumed to meet interception requirements. • Further reductions in land take can be achieved by adopting a Long-Term Storage approach (SuDS Standards: G2.30), or through design of green roofs, rainwater harvesting systems and infiltration where appropriate. It is noted that contamination could preclude an unlined basin. • Attenuation volumes are presented for the critical storm duration for the 1 in 30-year events with exceedance flows quantified up to the 1 in 100-year event. To prevent development worsening flood risk elsewhere, surface water runoff must be managed on site.					

PE1.2 Manor Lane, Hawarden Park Extension	
Overall Site Assessment	
Development suitability	• **As the site lies within DAM Zone C2, the justification test (Section 6, TAN 15) will need to be applied with the potential consequences of flooding to the site occurring being accepted. Appendices A1.14 and A1.15 of TAN 15 provide indicative guidance on acceptable thresholds for employment (commercial/retail) use.** • **In accordance with Table A1.14 of TAN 15, the development would be expected to be designed to be flood free up to the fluvial 1% AEP + climate change event for the Manor Road culvert blockage scenario on Broughton Brook.** • **Given the confinement of risk, development is likely to be suitable at this location. The main development should be prioritised away from the risk areas and towards the eastern and western areas of the site away from the watercourse.** • **NRW would require that development account for a 8m access/maintenance buffer along Broughton Brook. This buffer should be extended to cover the risk areas by way of a blue green corridor whereby conveyance of water should be maintained.** • **Site design should look to avoid any further culverting of Broughton Brook as a means of connecting the site from east to west. In terms of limiting flood risk, the preference would be for two site access points either side of Broughton Brook.** • **Safe access/egress routes can be achieved via Manor Lane to the north west and the B5125 to the south.** • **With the assumption that it should be possible to avoid developing in the risk area, it is unlikely that development at this site would adversely affect flood risk elsewhere.** • **Given the presence of a watercourse onsite, the FCA should include an Emergency Plan detailing evacuation routes and procedures in the event of a flood.** • **The FCA will need to include an assessment of ground conditions and suitability for SuDS through a hydrogeological investigation.**

4 PE1.4 Greenfield Business Park Phase II

PE1.4 Greenfield Business Park Phase II	
Location	Greenfield Business Park, Greenfield
Site area (ha)	0.97
Watercourses	Wal-wen watercourse, New Brighton Drain, Fishpool Drain, other smaller unnamed drains, River Dee (tidal estuary)
NRW Model used	Greenfield 2014
Existing use	Greenfield
Existing site flood risk vulnerability classification (TAN 15)	Not classified - open green space
Proposed development flood risk vulnerability classification (TAN 15)	Less vulnerable
Proposed development impermeable area (ha) – *70% based on FCC advice*	0.68

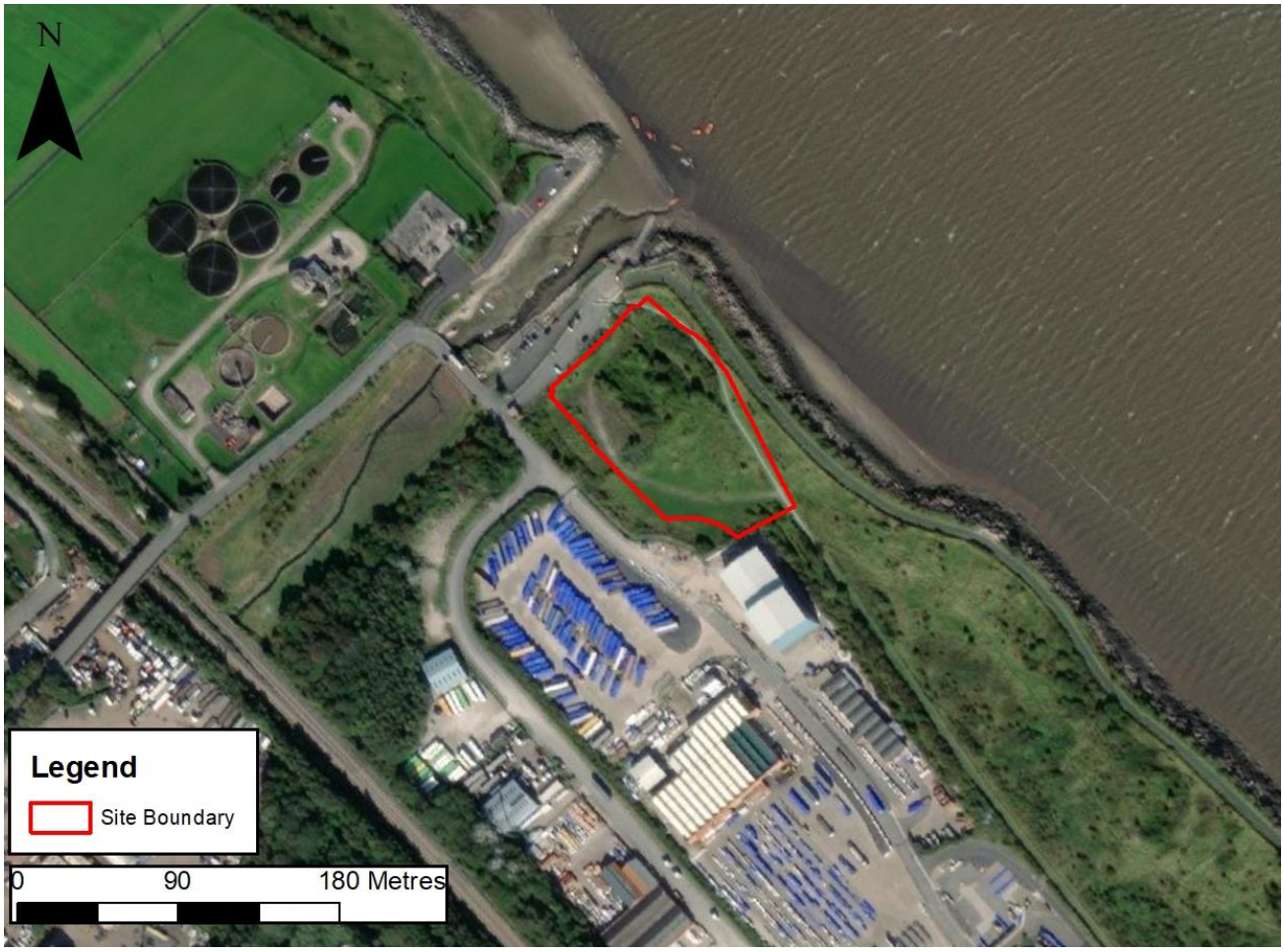


Figure 4-1 Aerial imagery of the site

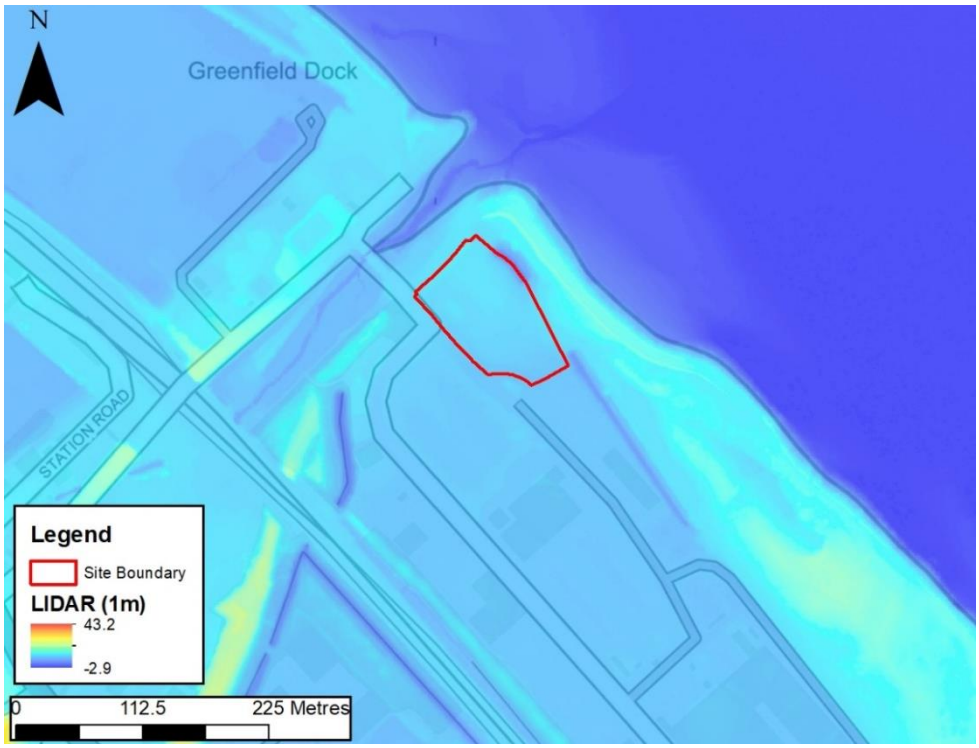


Figure 4-2 Site boundary with 1m LIDAR

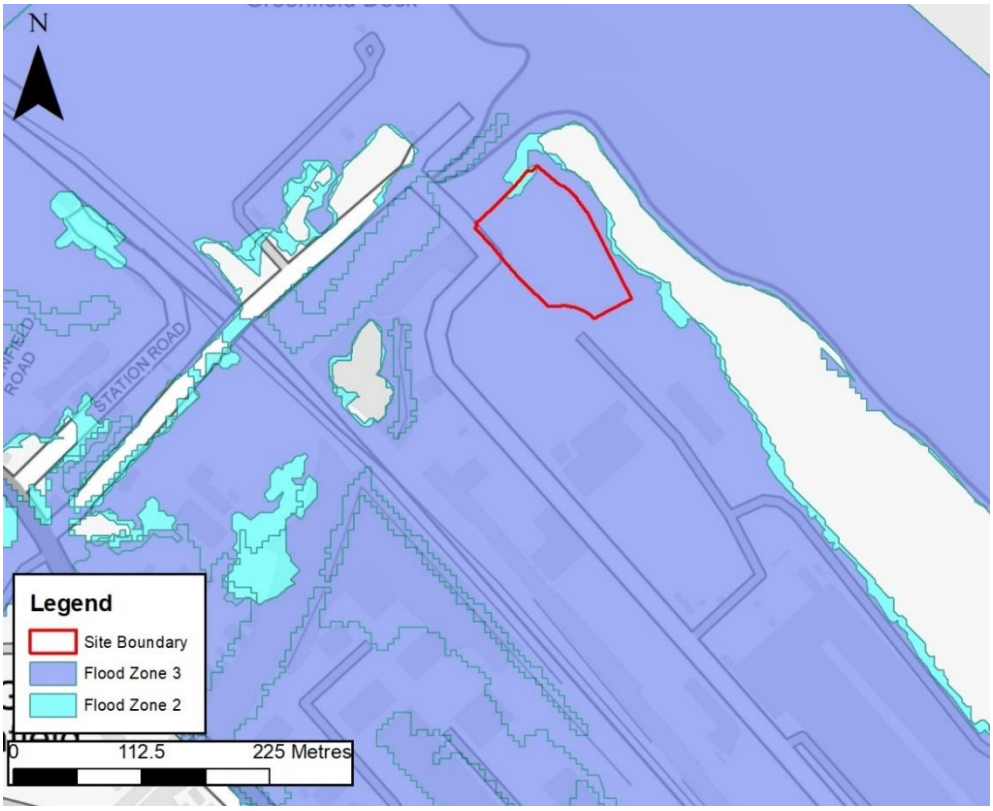


Figure 4-3 Site boundary with NRW Flood Zones 2 and 3

PE1.4 Greenfield Business Park Phase II

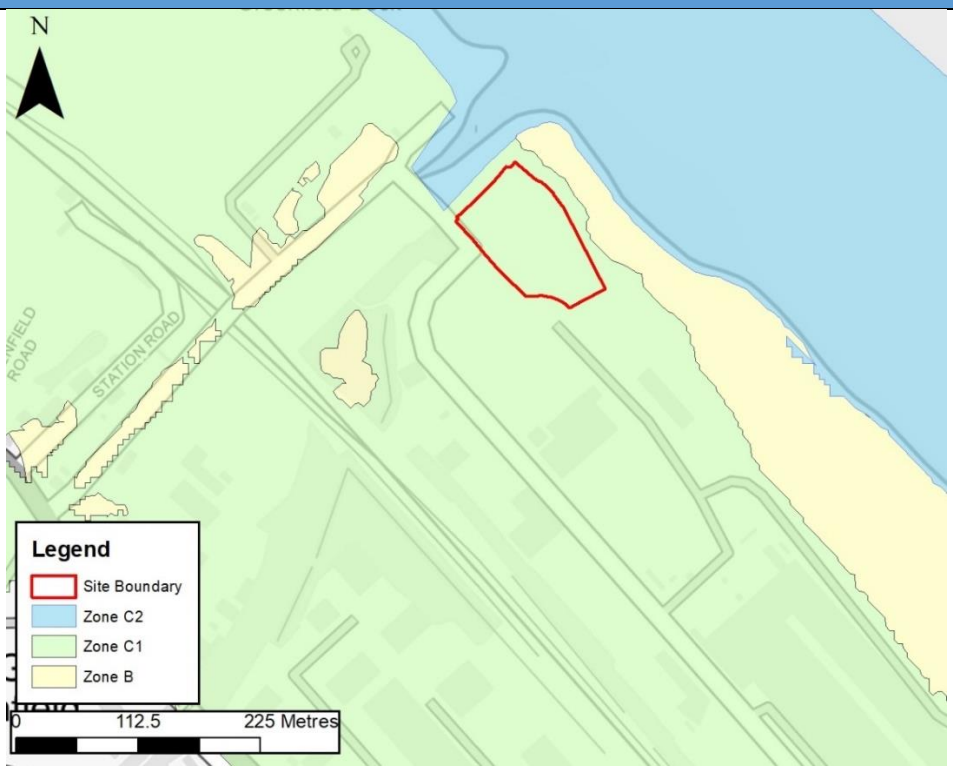


Figure 4-4 Site boundary with DAM mapping

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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earth star Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID. IGN, and the GIS User Community.
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Contains Natural Resources Wales information © Natural Resources Wales and/or database right.

Key findings from the 2020 Flintshire Strategic Flood Consequence Assessment (SFCA)

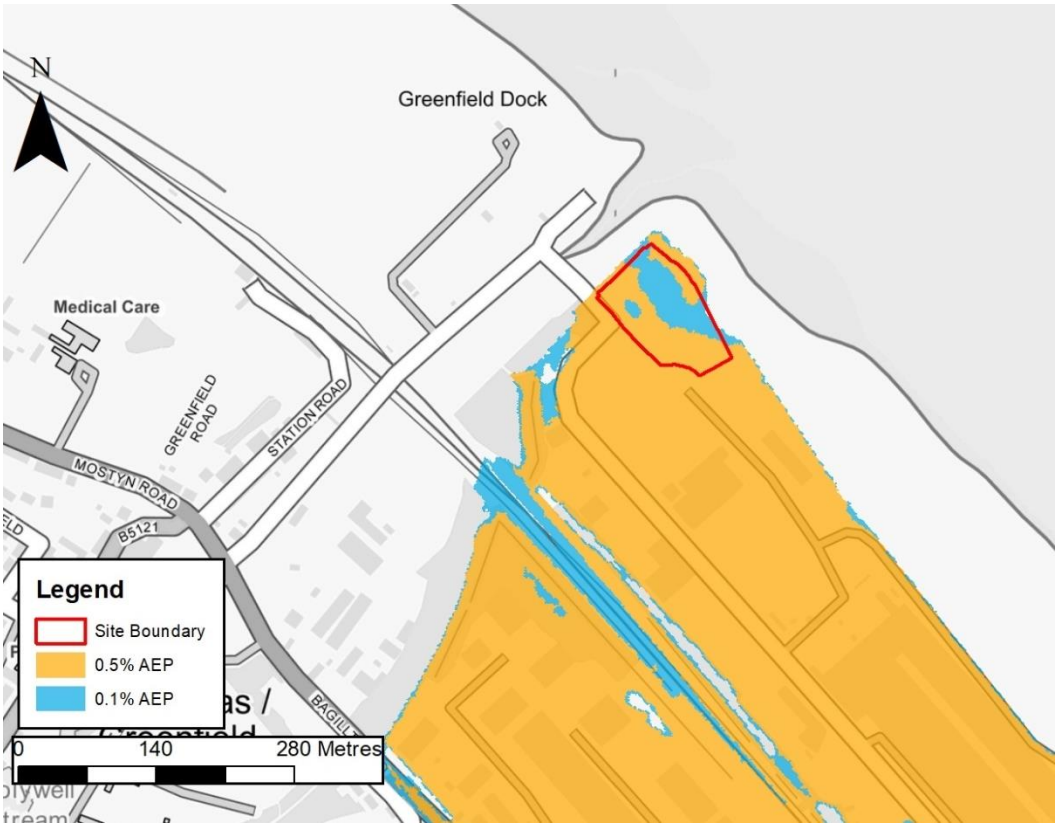
- The site is 100% within DAM Zone C1 and 98% within Flood Zone 3.
- Risk is tidal from the adjacent Dee Estuary.
- No risk identified from the Dee defence breach scenario modelling; however, this is not to say there is no risk from a defence breach, only that the modelled breach locations do not impact on this site.
- Nominal surface water risk.
- TAN 15 advice: Plan allocations and applications can only proceed subject to accordance with Section 6 and acceptability of consequences in accordance with Section 7 and Appendix A.

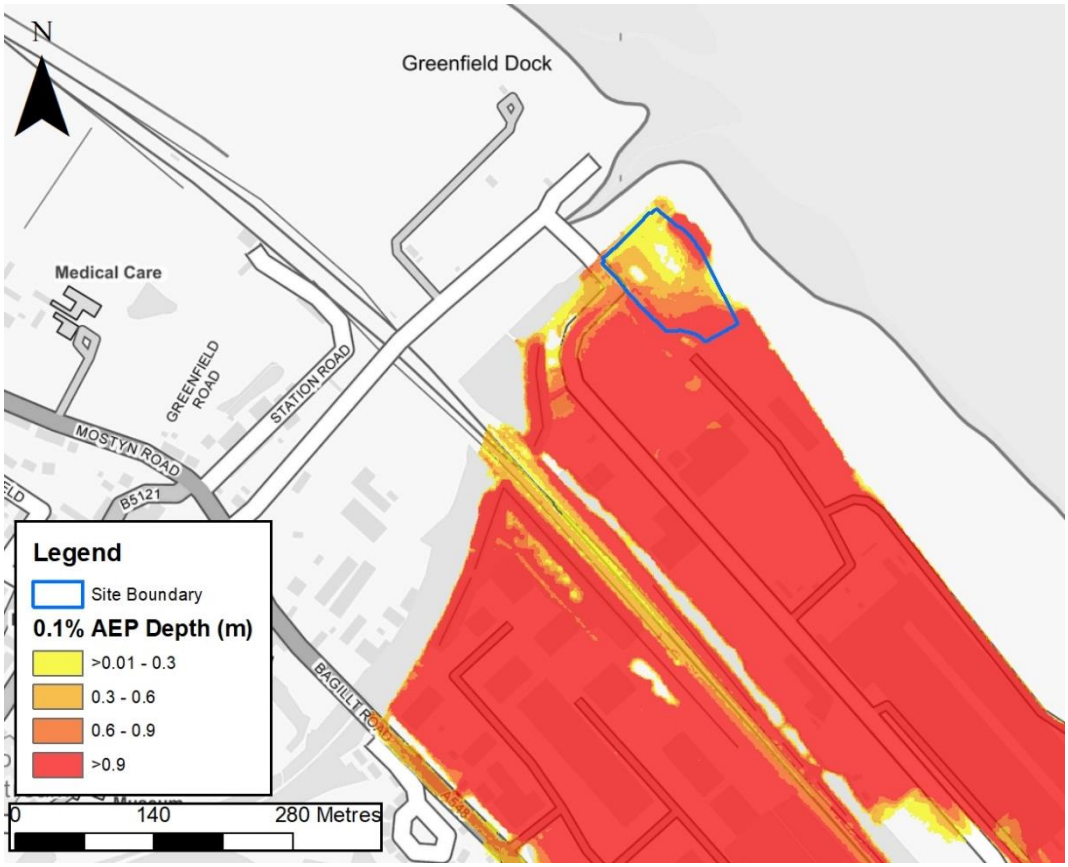
Modelled Flood Source: Tidal*

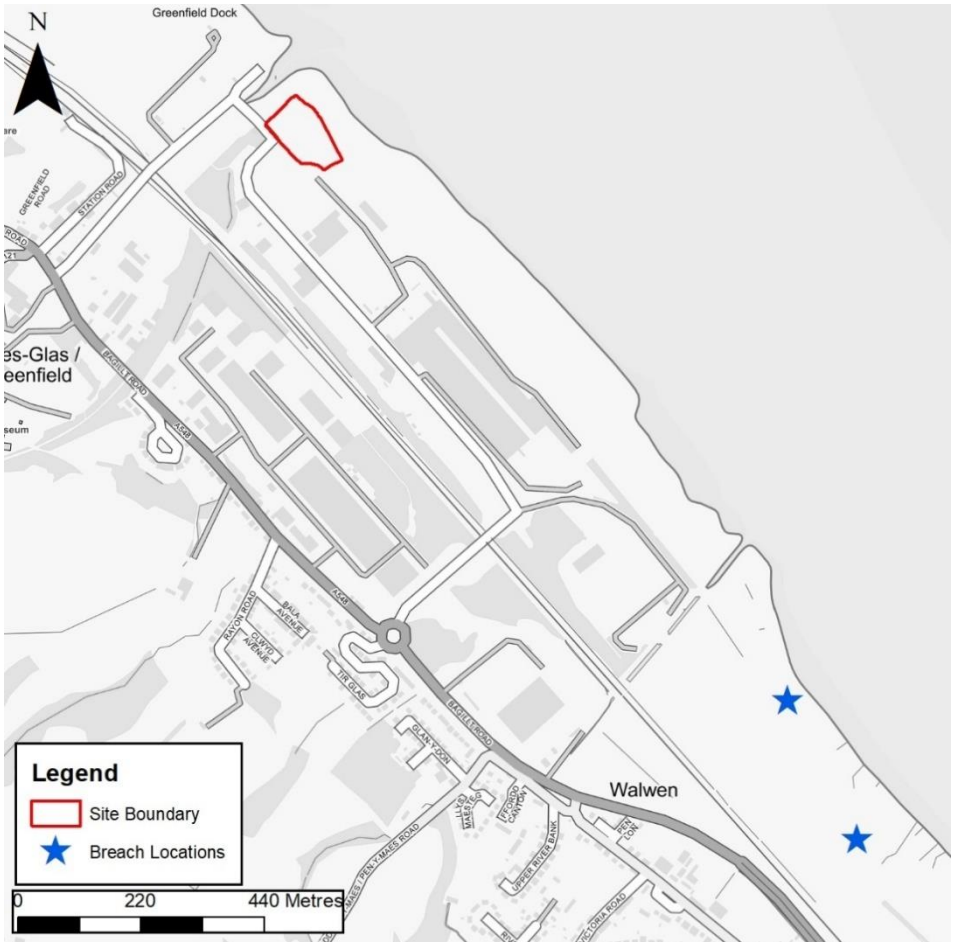
Flood Zones (%)	Flood Zone 3	Flood Zone 2	Climate Change**
	98	100	n/a
Tidal: average depth (m)	0.4	0.7	n/a
Tidal: maximum depth (m)	4.2	4.8	n/a
Tidal: average hazard	Low	Low	n/a
Tidal: maximum hazard	Extreme	Extreme	n/a

*Based on Greenfield hydraulic model 2014

**Climate change only modelled for overtopping scenarios, not available for baseline or breach modelling. 0.1% AEP extent/Flood zone can be used as proxy

PE1.4 Greenfield Business Park Phase II	
Modelled tidal risk from Greenfield model on numerous watercourses and drains	 **Figure 4-5 Modelled tidal flood risk to the site for the defended 0.5% and 0.1% AEP events (Greenfield 2014 model)** • The site is modelled to be at risk in both the 0.5% and 0.1% AEP events. Whilst a portion of the site remains free from flooding during the 0.5% AEP event, the whole site is impacted during the 0.1% event, see Figure 4-5. The same is true for the surrounding areas to the south. • Modelled flood depths for the 0.1% AEP event are shown in Figure 4-6. Flood depths are highest in the southern corner with values steadily reducing the further into the site. However, much of the site has modelled flood depths greater than 300mm. • The Greenfield 2014 hydraulic model does not contain any climate change modelling outputs for either the baseline or breach scenarios. As such, the 0.1% AEP outline is used as a proxy for estimating climate change.

PE1.4 Greenfield Business Park Phase II	
	 **Figure 4-6 Modelled tidal flood depths at the site for the 0.1% AEP event** • The modelled flood outlines from the Greenfield 2014 model do not entirely match the flood zones, suggesting that Flood Zones 2 and 3 are based on additional data, likely to be tidal outlines from the Dee Estuary as Flood Zones 2 and 3 are shown to extend into the channel of the Dee Estuary. • Modelled flood outlines for the Tidal Dee Estuary are unavailable in this location as they have been recently superseded by the 2018 Coastal Flood Boundary (CFB). This dataset provides extreme sea level values around the coast of the UK. In addition, the 2018 release also included levels for estuaries, the Dee included. The CFB dataset shows that, in a 0.5% AEP event, the extreme flood level at the site is 6.3m and 6.55m in a 0.1% AEP event.
Modelled tidal risk from Dee defence breaches	• Defence breach scenarios were modelled on the coastal embankments along the River Dee as part of the Greenfield hydraulic model. At this location the defences are rated as poor/4, breaches are located at NGR: SJ2091476892 and SJ2103776645, see Figure 4-7. The outlines from the 0.5% AEP and 0.1% AEP breach events (Figure 4-8) are similar to the baseline scenarios for the same events, see Figure 4-5.

PE1.4 Greenfield Business Park Phase II	
	 **Figure 4-7 Site boundary with location of the modelled breaches**

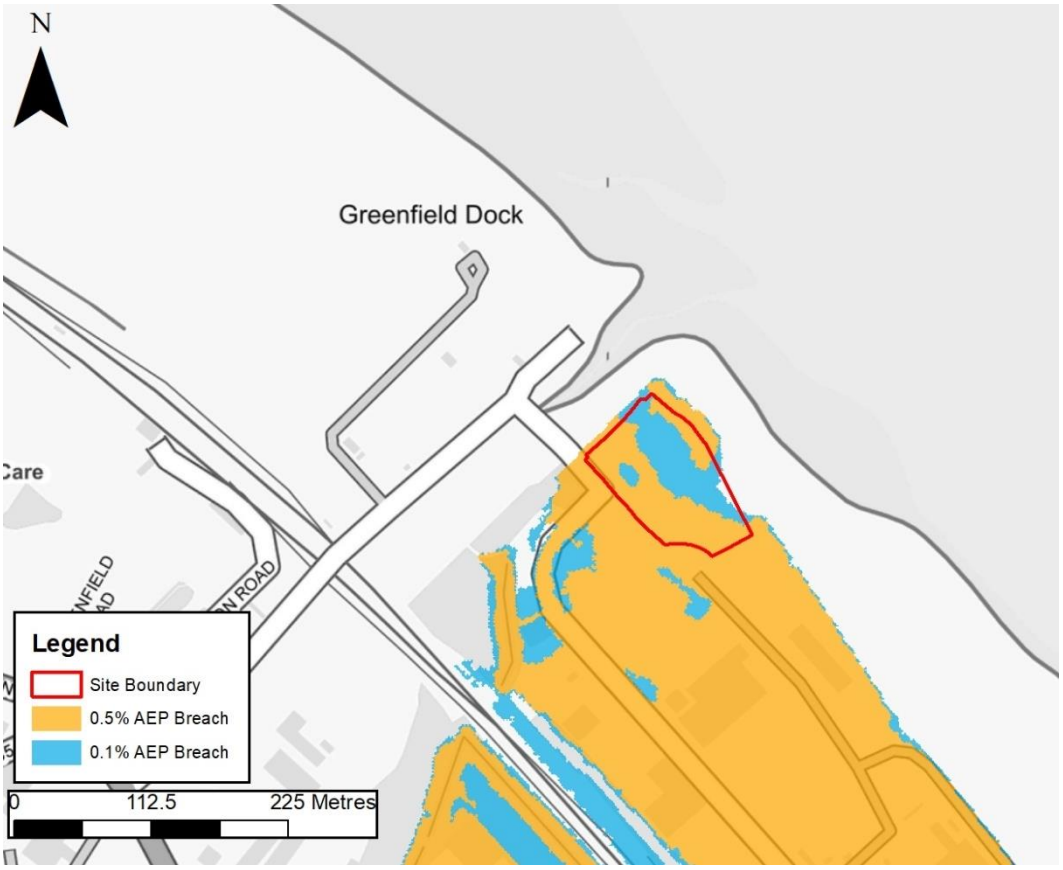
PE1.4 Greenfield Business Park Phase II	
	 **Figure 4-8 Modelled breach scenario for the 0.5% and 0.1% AEP events** • Flood depths during the 0.5% AEP event are on average between 0.24-0.3m with this increasing to 0.4-0.6m in the 0.1% AEP event, see Figure 4-9. Again flood depths are lower towards the centre and north of the site.

Figure 4-9 Modelled breach scenario depths for the 0.1% AEP event

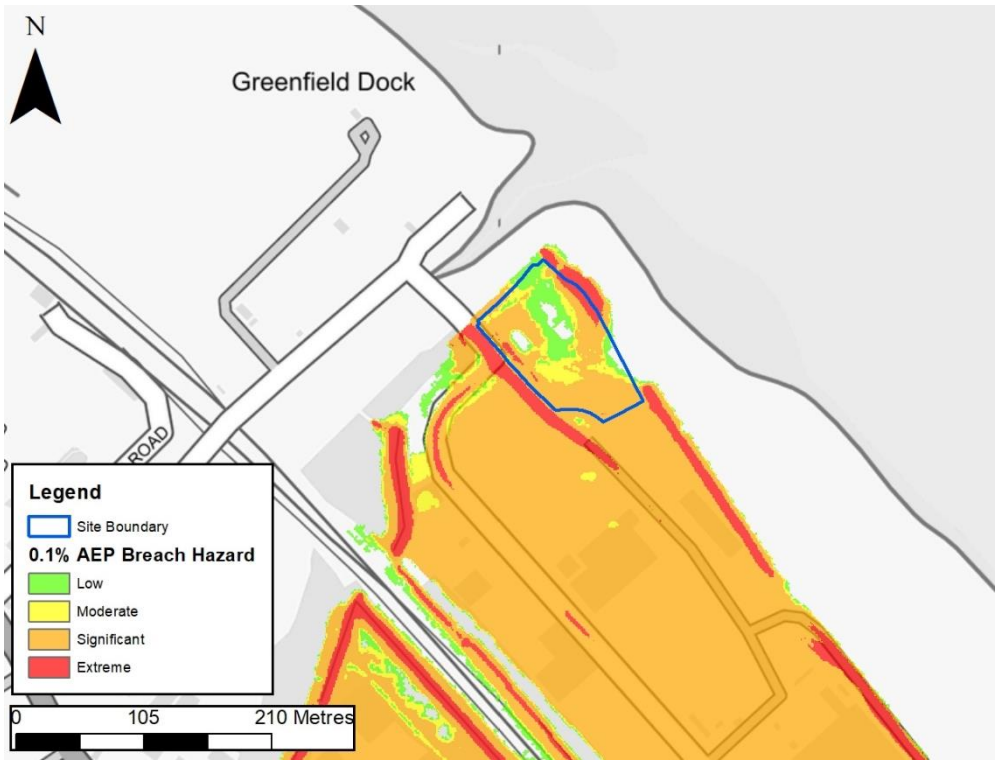


Figure 4-10 Modelled hazards for the 0.1% AEP breach scenario

- Figure 4-10 shows flood hazards at the site are mainly classed as significant with the centre of the site seeing lower overall risk with hazards reduced to low. However, there are also small pockets of extreme flood hazard.

PE1.4 Greenfield Business Park Phase II	
Historic flooding	• No part of the site is within NRW's Historic Flood Map.
Defences	• Based on NRW's Spatial Flood Defences dataset, coastal defence embankments are located close to the site along the Dee Estuary. These are classified with a condition rating of 3/fair or 4/poor and with a standard of protection of 200 years.
Flood Alert/Warning Area	• The site lies within one Flood Alert Area and two Flood Warning Areas. The alert area is listed as 'areas along the North Wales coast from the Dee Estuary to the east coast of Anglesey'. The two warning areas are 'the communities of Greenfield and Bagillt, from the outskirts of Flint up to Mostyn Docks' and 'Dee Bank, Whelston, Wal-wen and Greenfield business park'.
Observations, mitigation options & site suitability: tidal	• **The site is modelled to be wholly at tidal risk in defended scenarios, according to the Greenfield 2014 model and also at significant risk during a breach event.** • **Flood Zone 3 is shown to cover virtually the whole site whilst the whole site is with DAM Zone C1.** • **The Greenfield model was originally ran in 2014 using tidal curves derived from the same year, as such it should be expected that an additional 21mm requires adding onto any of the modelled flood levels to account for the sea level rise that will have occurred between 2014 and 2020. This point is also relevant for future risk when considering development. For instance, any development being constructed with a 75-year lifetime would need to accommodate for that amount of sea level rise, i.e. 751mm and up to 823.5mm for a development with a 100-year lifetime. These uplifts are in line with the latest Welsh guidance on climate change and sea level rise[5].** • **The 2018 Coastal Flood Boundary dataset in the Dee Estuary has been derived from a base year of 2017 so an increase of 11mm is required to provide the level for 2020. For climate change this would calculate to a rise of 740mm and 812.5mm for a 75 year and 100 year increase respectively.** • **In accordance with Table A1.14 of TAN 15, the development would be expected to be designed to be flood free up to the tidal 0.5% AEP + climate change event. It is clear that any development on this site could not remain flood free and mitigation would be required, were development to take place.** • **As the main source of flood risk to the site is tidal, land raising may be appropriate, without having to find room for compensatory storage. However, displaced water would have to be controlled and directed back into the Dee so as to not increase risk elsewhere. The appropriateness of this approach would have to be discussed and agreed with NRW.** • **The FCA should include climate change modelling to fully quantify the risk to the site and to confirm requirements for finished floor levels. Based on Table A1.15 of TAN 15, development is not advisable where flood depths exceed 600mm.** • **Land to the west of the site remains flood free according to the modelled risk therefore access may be achievable via Dock Road. However, Dock road and all surrounding areas are within Flood Zone 3**

5 Flood Consequence Assessments: Climate Change Allowances, gov.wales/sites/default/files/publications/2018-11/flood-consequence-assessments.pdf

PE1.4 Greenfield Business Park Phase II	
	and DAM C1. • **Given the site is within Zone C1, confirmation on the condition, reliability and future maintenance arrangements for the Dee defences should be sought from NRW.** • **A suitable emergency plan should also accompany the FCA, detailing evacuation routes and procedures in the event of a flood.**
Flood Source: Groundwater	
Flood risk: groundwater	• Due to the site's proximity to the Dee Estuary, it is assumed that groundwater levels will follow the natural topography and flow east towards the estuary. • The site-specific FCA should fully investigate ground conditions.
Flood Source: Surface Water	
Surface Water Flood Risk to Proposed Development Site	

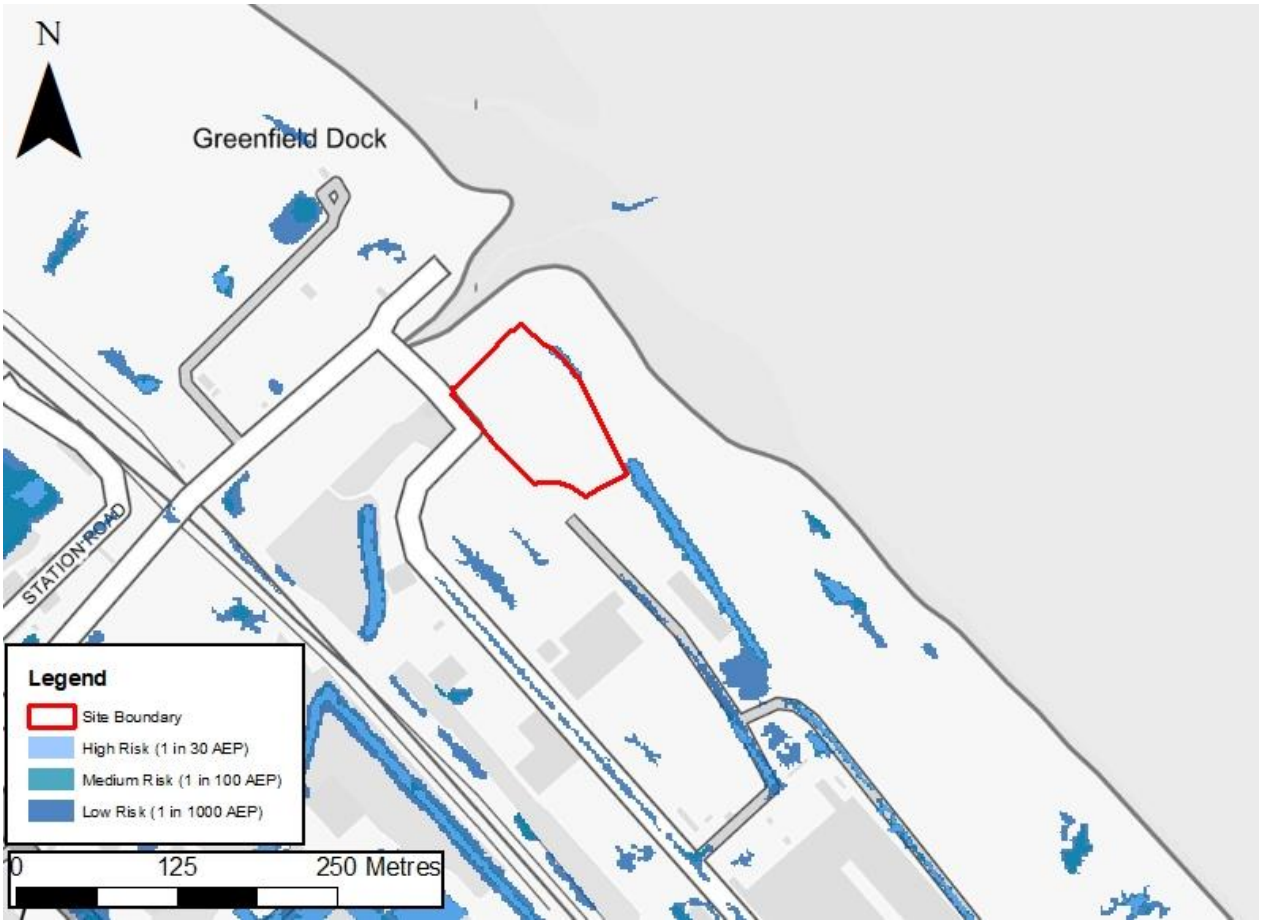


Figure 4-11 Surface water risk to site PE1.4 (NRW Risk of Flooding from Surface Water map)

Existing development: Risk of Flooding from Surface Water map (%)	High Risk (1 in 30 AEP)	Medium risk (1 in 100 AEP)	Low risk (1 in 1000 AEP)
	0.00	0.00	0.7
Surface water flooding depths	Max: n/a	Max: n/a	Max: 0.9
Surface water	Max: n/a	Max: n/a	Max: Significant

PE1.4 Greenfield Business Park Phase II			
hazards	Mean: n/a	Mean: n/a	Mean: Significant
Surface water flood risk to development site	• Risk is nominal and limited to a small area on the northern boundary of the site.		
Climate change	• The current day 0.1% surface water outline provides an indication of the likely increase in extent of more frequent events. Only the north-western areas of the site are impacted by surface water flood extents so risk from surface water is presumed to remain low in the future.		
Mitigation options & site suitability: surface water	• **Surface risk to the site is overall minimal with the site being impacted in the lowest risk event only. Any development should seek to avoid the north-western corner.**		

Surface Water Flood Risk from Proposed Development

Proposed development limiting runoff rate in accordance with G2.30 of Welsh SuDS Standards: (l/sec)
Qbar: 2* l/s (FEH Statistical)
*Note that a minimum flow rate of 5l/s may be applied only where there is a risk of throttle outlets being blocked and it can be demonstrated that no alternative practical SuDS arrangement could be used that would reduce this blockage risk.

Design flood event (incl climate change)	Critical storm duration Hrs	Inflow volume m^3	Outflow volume m^3	Attenuation required m^3	Time to empty (assuming no infiltration) Hrs	Total detention basin storage required: Area (ha) of unlined base and depth (m)
30yr Rainfall+20%	12	624	60	564	111.5	0.16 ha 0.35 m
30yr Rainfall+40%	12	728	60	668	132.1	0.16 ha 0.42 m
100yr Rainfall+20%	12**	811	60	751 (187m3 of exceedance storage)	148.5	0.16 ha 0.47 m
100yr Rainfall+40%	12**	946	60	886 (218m3 of exceedance storage)	175.3	0.16 ha 0.55 m

**limited to corresponding 30yr Rainfall critical storm duration

Climate change	• Application of the central (20%) and upper band (40%) potential change anticipated for climate change in the table above shows the estimated attenuation volumes for the 1% AEP and 3.33% AEP rainfall events.
Surface water: flood risk impacts from development site, mitigation & SuDS	• As part of this appraisal we have included calculations to provide an estimated land take if a detention basin is used to attenuate runoff. In accordance with Table G2.1 of Welsh SuDS Standards, the drained impermeable surface area (assumed 85%) should be less than 5 times the vegetated surface area receiving the runoff. This is equivalent to 17% of the total site. • This provides a high land take estimate. Where infiltration rates are greater than 1x10-6m/s, areas up to 25 times the base area of the basin can be assumed to meet interception requirements.

PE1.4 Greenfield Business Park Phase II	
	• Further reductions in land take can be achieved by adopting a Long-Term Storage approach (SuDS Standards: G2.30), or through design of green roofs, rainwater harvesting systems and infiltration where appropriate. It is noted that contamination could preclude an unlined basin. • Attenuation volumes are presented for the critical storm duration for the 1 in 30-year events with exceedance flows quantified up to the 1 in 100-year event. To prevent development worsening flood risk elsewhere, surface water runoff must be managed on site.
Overall Site Assessment	
Development suitability	• **100% of the site is within DAM Zone C1, therefore the justification test (Section 6, TAN 15) is required to be applied with the potential consequences of flooding to the site occurring being accepted. Appendices A1.14 and A1.15 of TAN 15 provide indicative guidance on acceptable thresholds for employment (commercial/retail) use.** • **In accordance with Table A1.14 of TAN 15, the development would be expected to be designed to be flood free up to the tidal 0.5% AEP + climate change event. It is clear that any development on this site could not remain flood free and mitigation would be required, were development to take place.** • **It is recommended that this site is not developed and is left as open space.** • **Any FCA should be used to model and confirm climate change levels for the critical design event and assess whether land raising could be appropriate. If the option for land raising is not agreeable with NRW then it is difficult to envisage how any development could take place at this site.**

5 PE1.5 Greenfield Business Park Phase III

PE1.5 Greenfield Business Park Phase III	
Location	Greenfield Business Park, Greenfield
Site area (ha)	4.4 (in 2 separate land parcels)
Watercourse	Wal-wen watercourse, New Brighton Drain, Fishpool Drain, other smaller unnamed drains, River Dee (tidal estuary)
NRW Model used	Greenfield 2014
Existing use	Mix of greenfield and brownfield – existing industrial units
Existing site flood risk vulnerability classification (TAN 15)	Less vulnerable
Proposed development flood risk vulnerability classification (TAN 15)	Less vulnerable
Proposed development impermeable area (ha) – *70% based on FCC advice*	3.08

Figure 5-1 Aerial imagery of the site

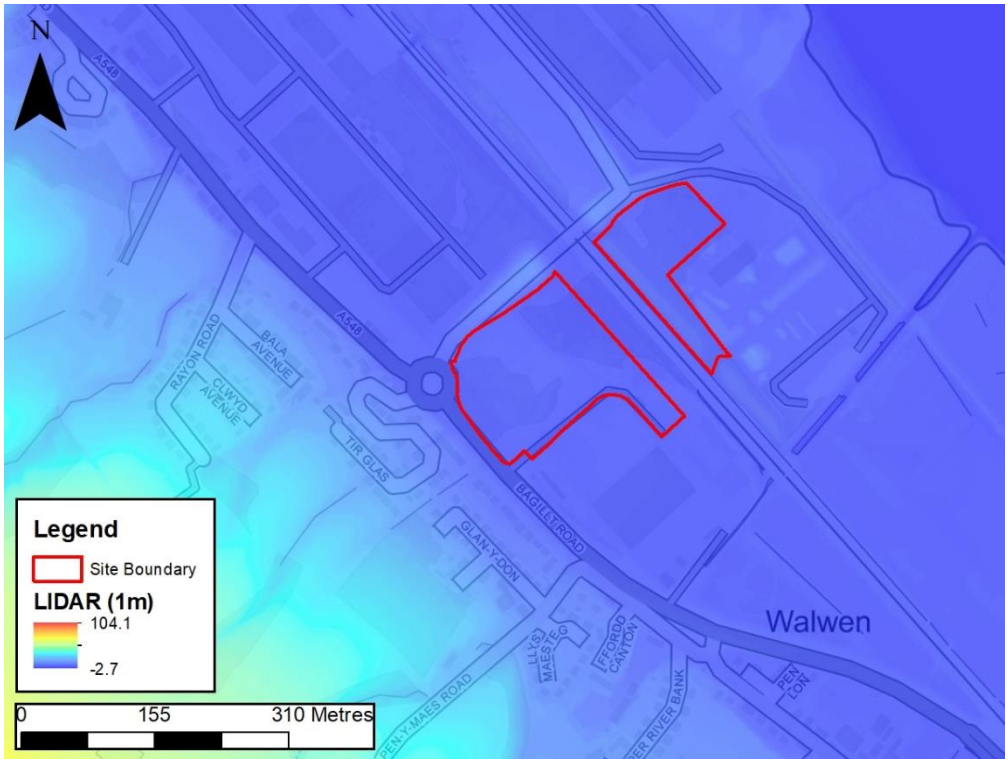


Figure 5-2 Site boundary with 1m LIDAR

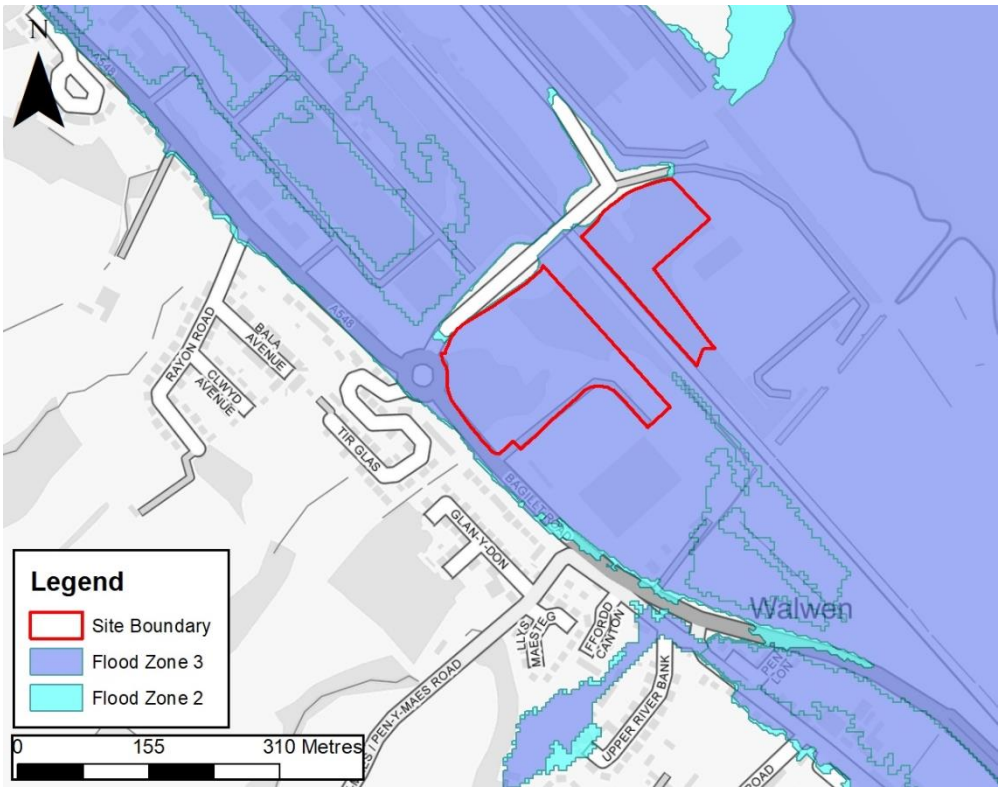


Figure 5-3 Site boundary with NRW Flood Zones 2 and 3

PE1.5 Greenfield Business Park Phase III

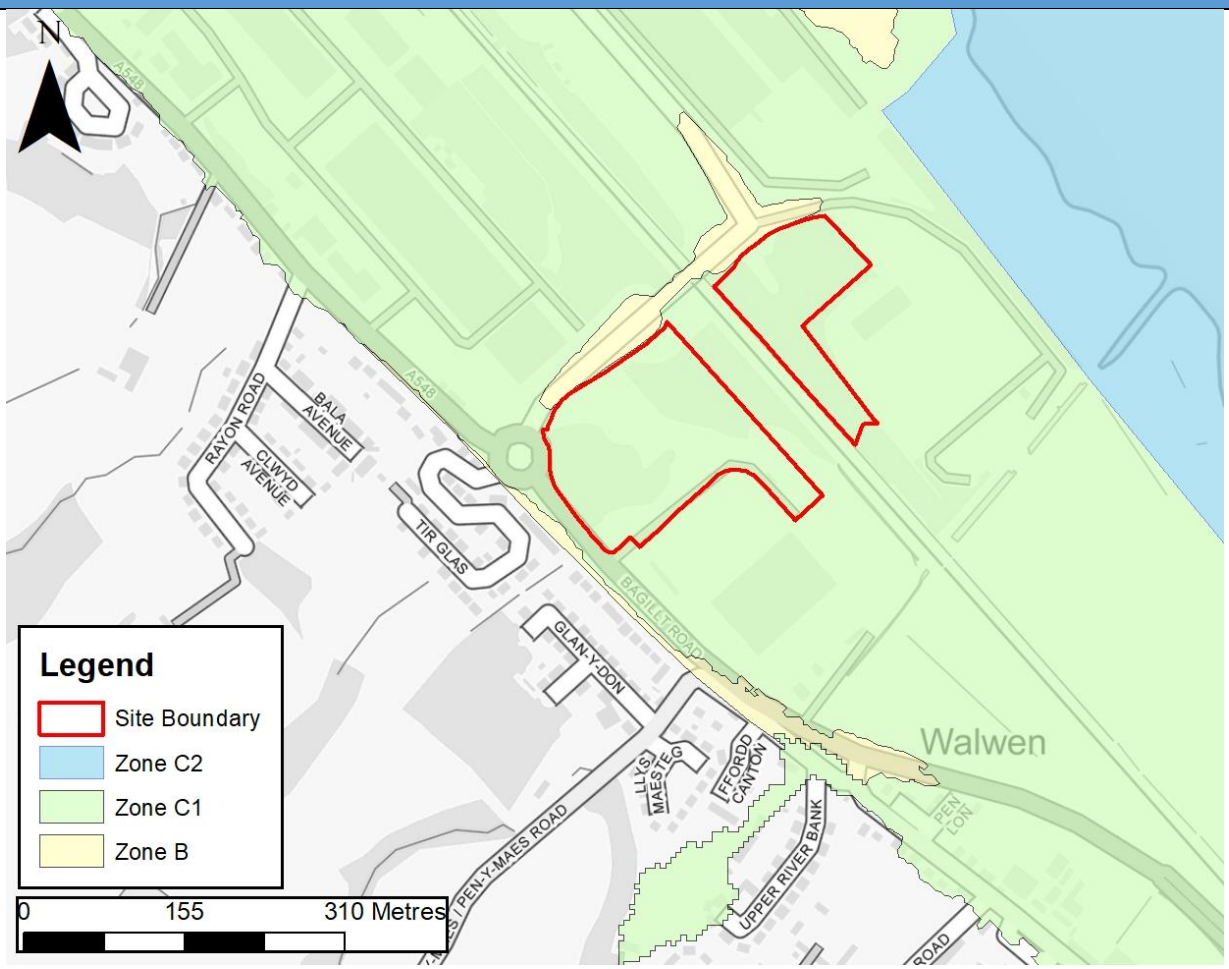


Figure 5-4 Site boundary with DAM mapping

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Key findings from the 2020 Flintshire Strategic Flood Consequence Assessment (SFCA)

- This appraisal refers to the southern land parcel as parcel 1 and the northern land parcel as parcel 2.
- The site is 100% within DAM Zone C1 and 100% within Flood Zone 3.
- The risk is tidal from the Dee Estuary.
- No risk identified from the Dee defence breach scenario modelling; however, this is not to say there is no risk from a defence breach, only that the modelled breach locations do not impact on this site
- TAN 15 advice – Plan allocations and applications can only proceed subject to accordance with Section 6 and acceptability of consequences in accordance with Section 7 and Appendix A.
- Parcel 1 is located on the south side of the railway line at the junction of the A548 and estate road. The southern part of this parcel has a present planning application (054700) for erection of warehousing, offices and off-license. The application is accompanied by an FCA though currently undetermined.

PE1.5 Greenfield Business Park Phase III			
Modelled Flood Source: Tidal*			
Flood Zones (%)	Flood Zone 3	Flood Zone 2	Climate Change**
	100	100	n/a
Tidal: average depth (m)	1.1	1.4	n/a
Tidal: maximum depth (m)	2.4	2.6	n/a
Tidal: average hazard	Significant	Significant	n/a
Tidal: maximum hazard	Extreme	Extreme	n/a

*Based on Greenfield hydraulic model 2014

**Climate change only modelled for overtopping scenarios, not for baseline or breach scenario modelling, 0.1% AEP extent/Flood zone can be used as proxy

Modelled tidal risk from Greenfield model on numerous watercourses and drains

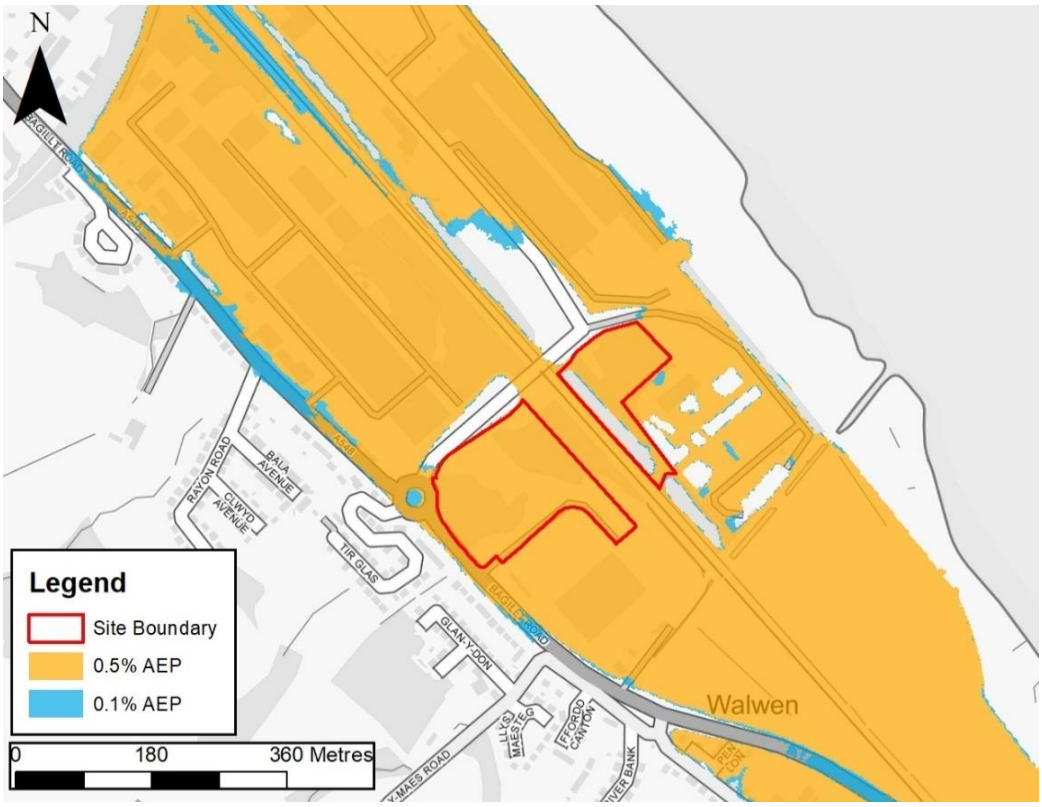
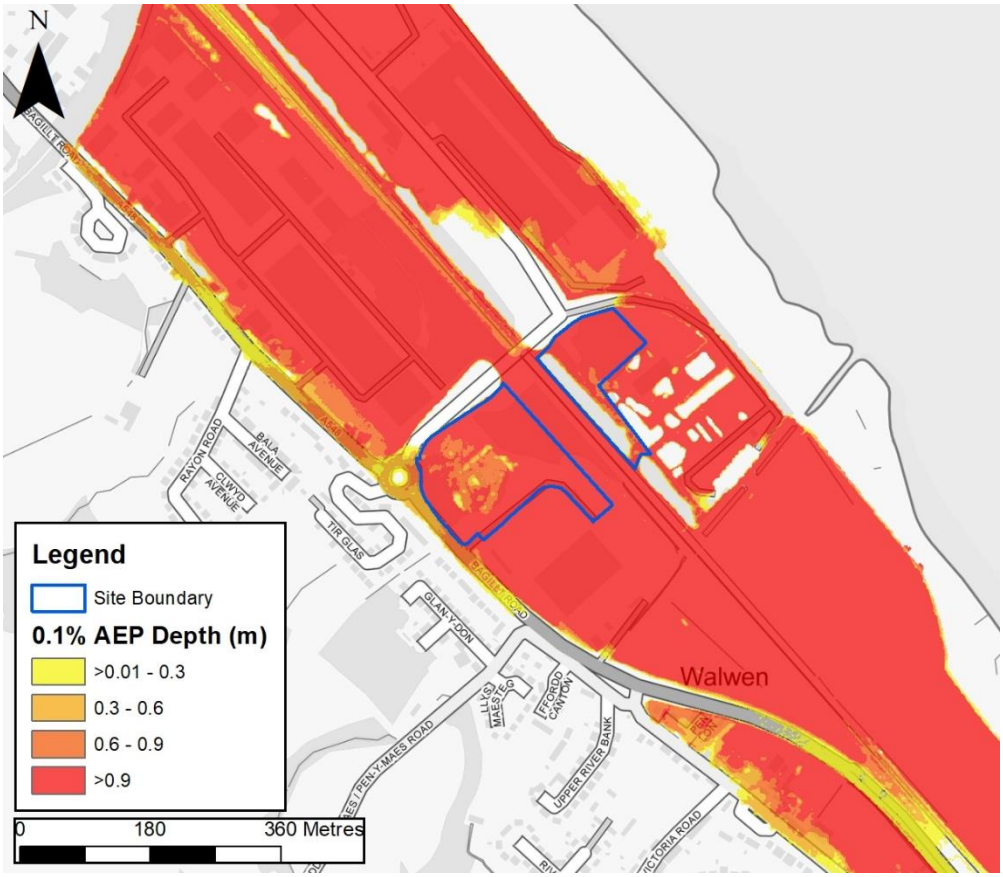
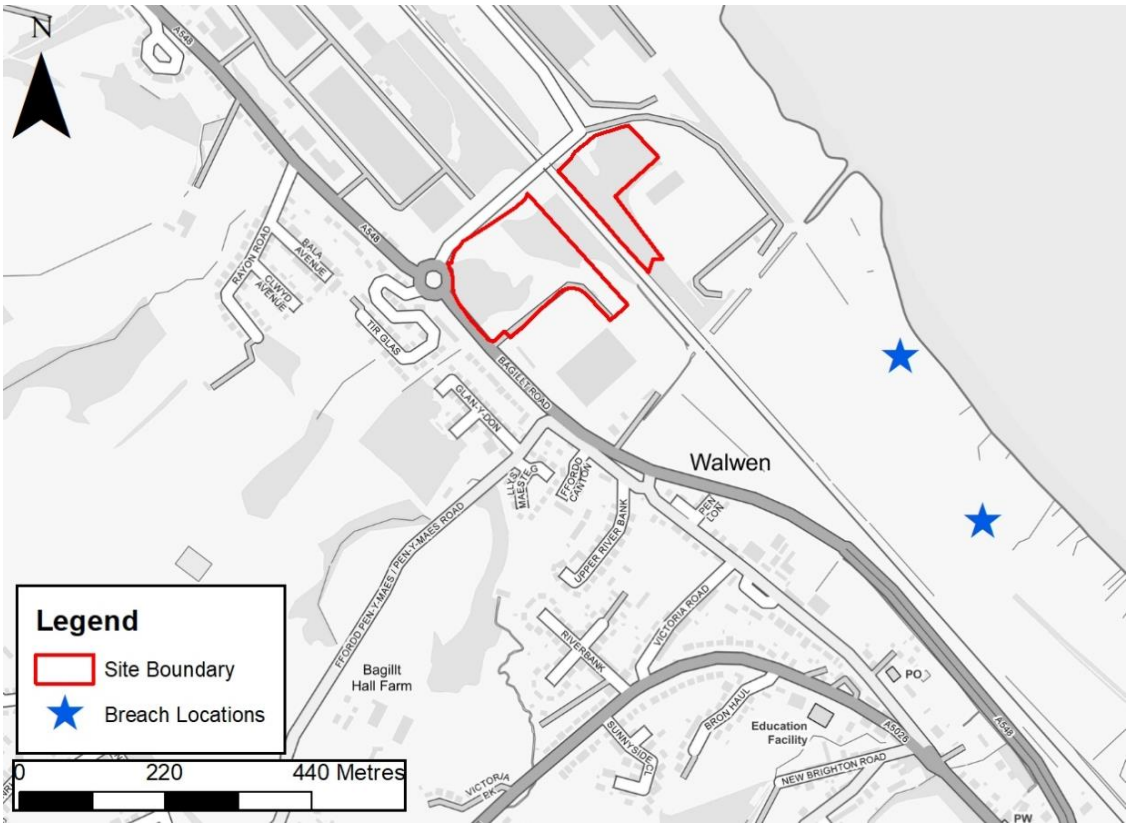


Figure 5-5 Modelled tidal flood risk to the site for the defended 0.5% and 0.1% AEP events (Greenfield model)

- In both the 0.5% and 0.1% AEP events, parcel 1 (southern-most site) is completely inundated by flooding with parcel 2 (northern-most) having a small strip of land on the southern border, adjacent to the railway line being free of flooding, see Figure 5-5. The same is true for the surrounding areas, north of the A548.
- During the 0.5% AEP event, flood depths to the site are between 1-1.5m all around parcel 1 with lower depths recorded in the centre where values are approximately 0.5m. Flooding is also modelled on the main access road to the immediate south of parcel 1 with depths between 0.1-0.3m. Flood depths in parcel 2 reach ~1.6m near the northern boundary with flooding reducing to 0.4m nearer the railway line.
- For the 0.1% AEP event, depths increase to around 2.2m with lower values of 0.8m in the centre in parcel 1. Parcel 2 sees depths of 1-1.8m with the same strip of land still outside of modelled flood extents, see Figure 5-6 for

PE1.5 Greenfield Business Park Phase III	
	0.1% AEP depths.  **Figure 5-6 Modelled tidal flood depths at the site for the 0.1% AEP event** • The Greenfield 2014 hydraulic model does not contain any climate change modelling outputs for either the baseline or breach scenarios. As such, the 0.1% AEP outline is used as a proxy for the extents resulting from climate change runs. • The supplied model outlines from Greenfield do not entirely match the flood zones suggesting that the flood map is based off additional data, likely to be tidal outlines from the Dee Estuary as the outlines extend into the channel. • Modelled flood outlines for the Tidal Dee Estuary are unavailable in this location as they have been recently superseded by the 2018 Coastal Flood Boundary (CFB). This dataset provides extreme sea level values around the coast of the UK. In addition, the 2018 release also included levels for estuaries, the Dee included. In a 0.5% AEP event, the extreme level at this site is 6.36m and 6.59 in a 0.1% AEP event.
Modelled tidal risk from breaches on Greenfield model	• Defence breach scenarios were modelled on the coastal embankments along the River Dee as part of the Greenfield hydraulic model. At this location the defences are rated as poor/4, breaches are located at NGR: SJ2091476892 and SJ2103776645, see Figure 5-7.

PE1.5 Greenfield Business Park Phase III	
	 **Figure 5-7 Breach locations in the Greenfield model in relation to site PE1.5** The outlines from the 0.5% AEP and 0.1% AEP breach events are largely similar to the baseline scenarios for the same event but with parcel 2 seeing overall less inundation in the 0.5% AEP breach event, see Figure 5-8.

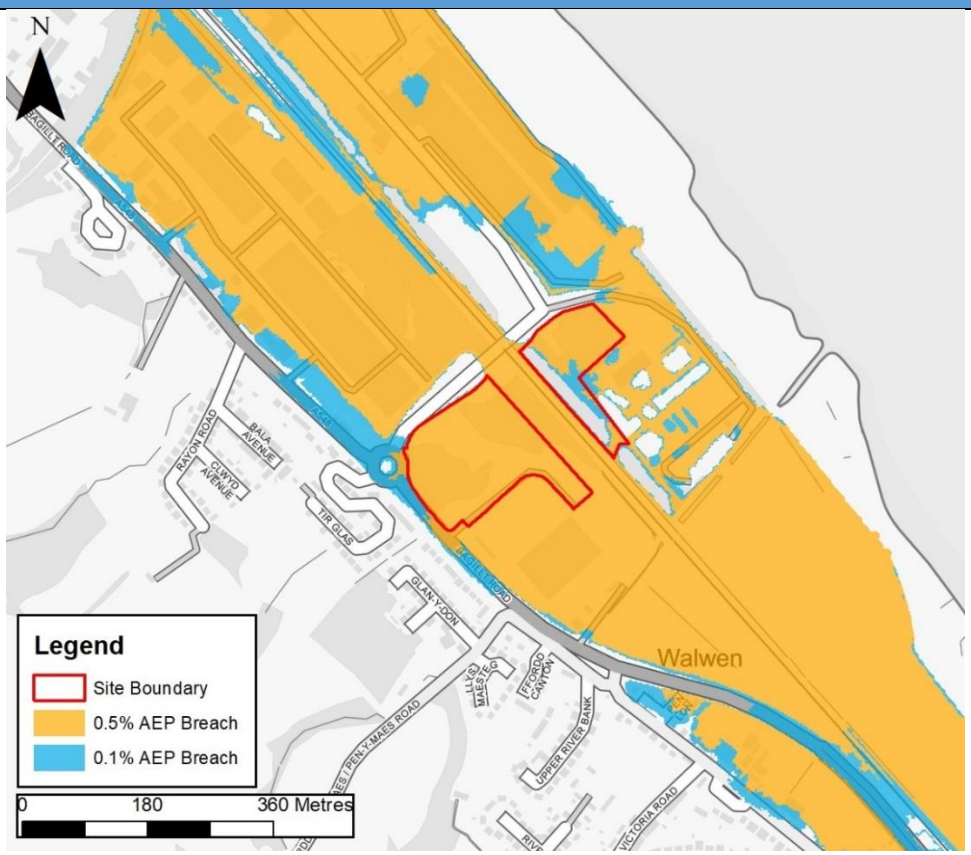
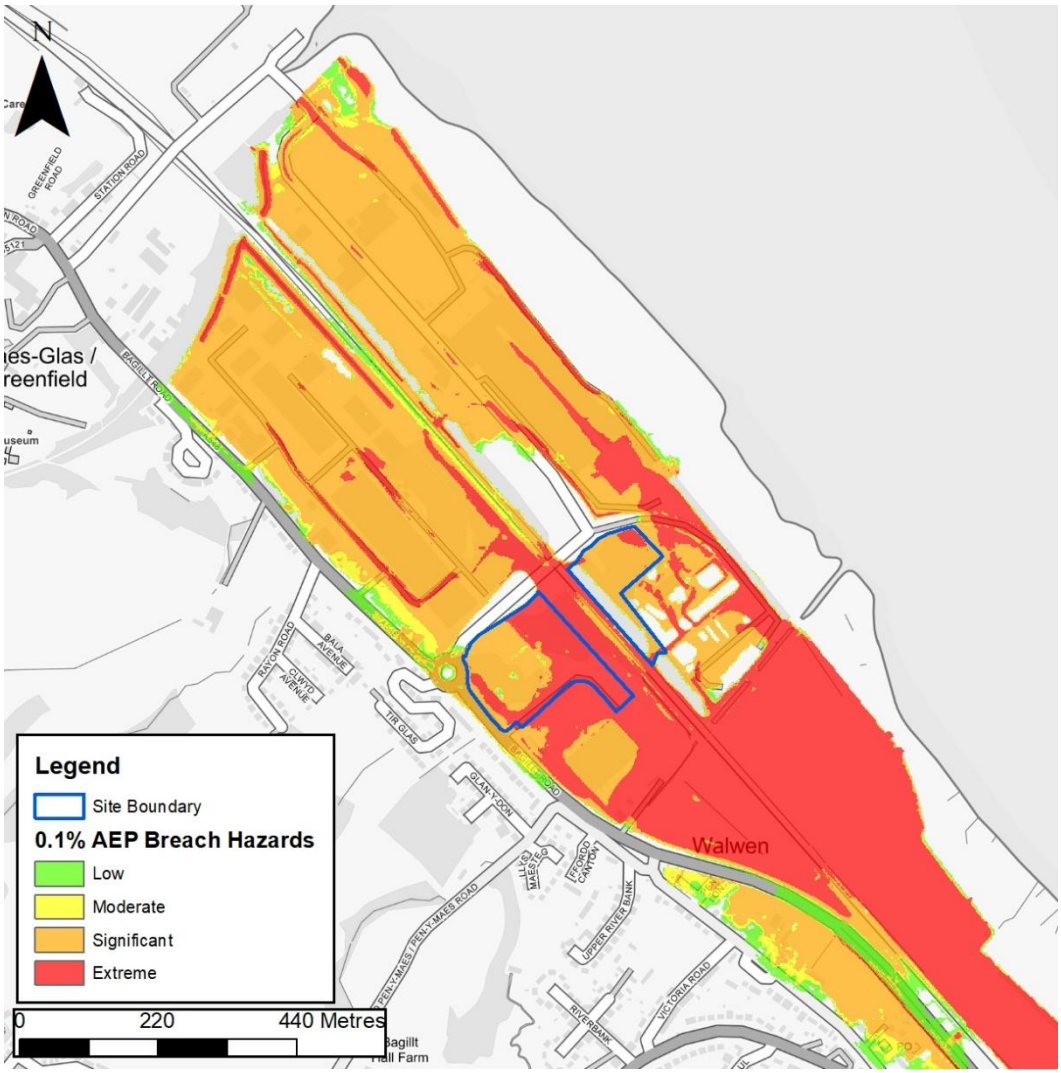


Figure 5-8 Modelled breach scenario for the 0.5% and 0.1% AEP event

Figure 5-9 Modelled depths for 0.1% AEP breach scenario

- Flood depths during the 0.5% AEP event are on average between 0.5-1.5m within parcel 1 and around ~0.6m within parcel 2. These values increase to

PE1.5 Greenfield Business Park Phase III	
	1-2m in parcel 1 and 0.7-1.4m inside parcel 2 for the 0.1% AEP event shown in Figure 5-9.  **Figure 5-10 Modelled hazards for the 0.1% AEP breach scenario** • Flood hazards during the 0.1% AEP breach scenario are overall higher in parcel 1 than in parcel 2 though most areas at risk within both parcels classed as significant or extreme.
Historic flooding	• The site lies outside areas included in the Historic Flood Map.
Defences	• Based on NRW's Spatial Flood Defences dataset, coastal defence embankments are located to the north-east of the site along the Dee Estuary. These are classified with a condition rating of 3/fair or 4/poor and with a standard of protection of 200 years.
Flood Alert/Warning Area	• The site lies within one Flood Alert Area and two Flood Warning Areas. The FAA is listed as 'areas along the North Wales coast from the Dee Estuary to the east coast of Anglesey'. The two FWAs are 'the communities of Greenfield and Bagillt, from the outskirts of Flint up to Mostyn Docks' and 'Dee Bank, Whelston, Wal-wen and Greenfield business park'.

PE1.5 Greenfield Business Park Phase III	
Observations, mitigation options & site suitability: tidal	• **The site is modelled to be wholly at tidal risk in defended scenarios, according to the Greenfield 2014 model and also at significant risk during a breach event. Parcel 1 sees the greater risk being wholly inundated during these modelled scenarios with parcel 2 being mostly inundated aside from a strip of land adjacent to the railway line. This is additionally true for the modelled breach scenarios which impact the site in a similar manner.** • **The site is shown to be at risk from breach scenarios on the Dee, modelled as part of the Greenfield hydraulic model during a 0.5% AEP and 0.1% AEP event.** • **Flood Zone 3 and DAM Zone C1 cover the whole site.** • **As the main source of flood risk to the site is tidal, land raising may be appropriate, without having to find room for compensatory storage. However, displaced water would have to be controlled and directed back into the watercourse so as not to increase risk elsewhere. The appropriateness of this approach would have to be discussed and agreed with NRW.** • **The Greenfield model was originally ran in 2014 using tidal curves being derived from the same year, as such it should be expected that an additional 21mm requires adding onto any of the modelled flood levels to account for the sea level rise that will have occurred between 2014 and 2020. This point is also relevant for future risk when considering development. For instance, any development being constructed with a 75-year lifetime would need to accommodate for that amount of sea level rise, i.e. 751mm and 823.5mm for a development with a 100-year lifetime. These uplifts are in line with the latest Welsh guidance on climate change and sea level rise[6].** • **The 2018 Coastal Flood Boundary dataset in the Dee Estuary has been derived from a base year of 2017 so an increase of 11mm is required to provide the level for 2020. For climate change this would calculate to a rise of 740mm and 812.5mm for a 75 year and 100 year increase respectively.** • **In accordance with Table A1.14 of TAN 15, the development would be expected to be designed to be flood free up to the tidal 0.5% AEP + climate change event. It is clear that any development on this site could not remain flood free and mitigation would be required, were development to take place.** • **The FCA should include climate change modelling to fully quantify the risk to the site and to confirm requirements for finished floor levels. Based on Table A1.15 of TAN 15, development is not advisable where flood depths exceed 600mm.** • **Access to the site may prove challenging as though the unnamed road, north-west of both site parcels, is not modelled to flood, the junction with the A548 and some of this road is shown to flood to depths between 0.1-0.3m in the 0.5% AEP event increasing to 0.4-0.7m in the 0.1% AEP event. Land to the west of the site remains free from the modelled flood risk so access remains achievable according to the modelled outputs. Though as highlighted prior, the main access route to the site along the unnamed road until the A548**

6 Flood Consequence Assessments: Climate Change Allowances, gov.wales/sites/default/files/publications/2018-11/flood-consequence-assessments.pdf

PE1.5 Greenfield Business Park Phase III	
	is within the extents of Flood Zone 3 and DAM C1. • **Given the site is within Zone C1, confirmation on the condition, reliability and future maintenance arrangements for the Dee defences should be sought from NRW.** • **A suitable emergency plan should also accompany the FCA, detailing evacuation routes and procedures in the event of a flood.**
Flood Source: Groundwater	
Flood risk: groundwater	• Due to the site's proximity to the Dee Estuary, it is assumed that groundwater levels will follow the natural topography and flow east towards the estuary. • The site-specific FCA should fully investigate ground conditions.
Flood Source: Surface Water	
Surface Water Flood Risk to Proposed Development Site	

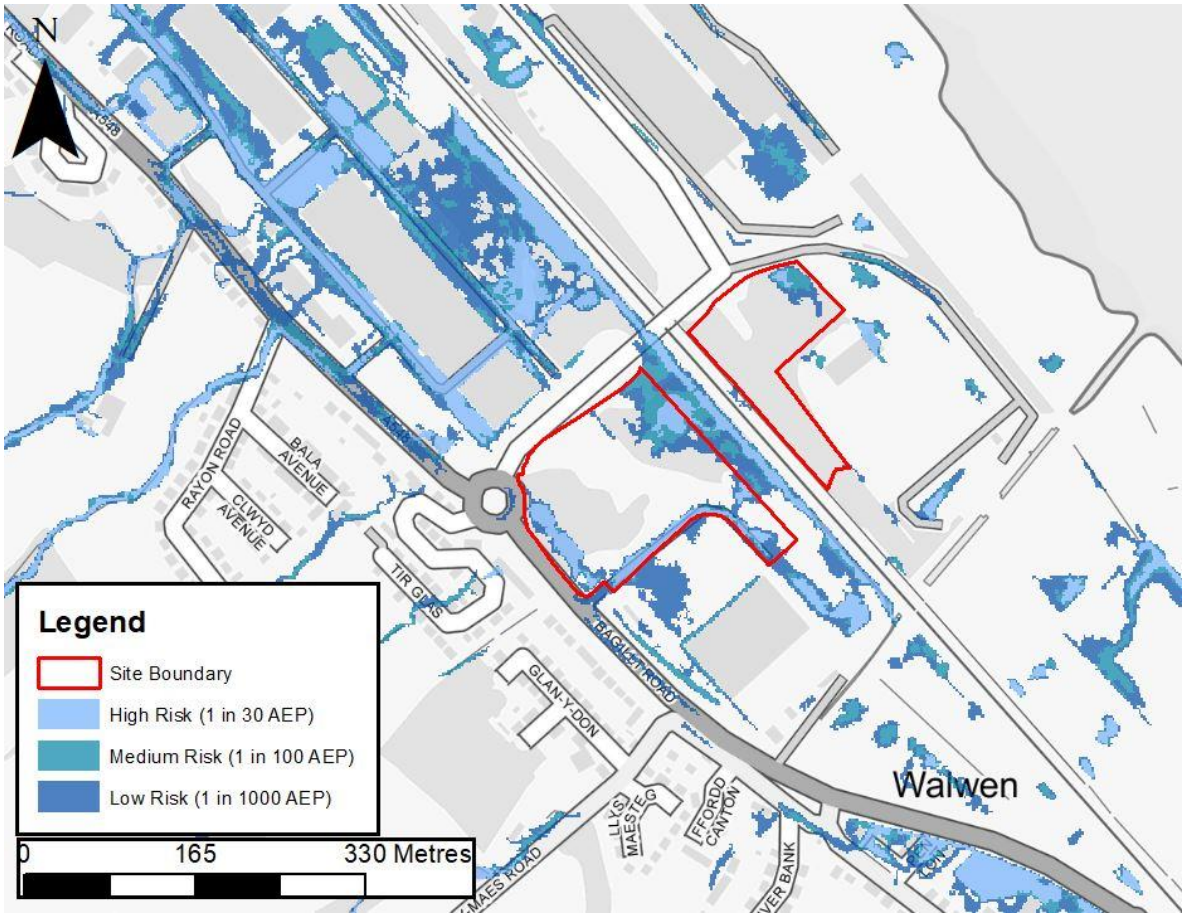


Figure 5-11 Surface water risk to site PE1.5 (NRW Risk of Flooding from Surface Water map)

Existing development: Risk of Flooding from Surface Water map (%)	High Risk (1 in 30 AEP)	Medium risk (1 in 100 AEP)	Low risk (1 in 1000 AEP)
	8.4	13.6	22.4
Surface water flooding depths	Max: 0.5	Max: 0.6	Max: 0.8
Surface water	Max: Moderate	Max: Significant	Max: Significant

PE1.5 Greenfield Business Park Phase III			
hazards	Mean: Moderate	Mean: Moderate	Mean: Moderate
Surface water flood risk to development site	• Surface water risk to the site is mainly concentrated on the site boundaries with central areas at very low risk. • Surrounding access roads are also shown to be at risk. • Maximum depths in the high risk/1 in 30 AEP event are 0.46m with this increasing to 0.79m in the low risk/1 in 1000 AEP event.		
Climate change	• The current day 0.1% surface water outline provides an indication of the likely increase in extent of more frequent events.		
Mitigation options & site suitability: surface water	• **The national Risk of Flooding from Surface Water is not suitable for providing site-specific advice. The FCA should there investigate surface water risk further through an outline drainage strategy.** • **Any proposed development should look to avoid the 1% AEP outline. Similar as with the fluvial risk, development should be prioritised towards the centre of the site.** • **The surface water flow paths should be effectively managed through appropriate SuDS measures, i.e. swales, incorporation of a blue-green corridor and not developed on. Ideally, natural flow paths should be left to flow and remain free of obstruction. The inclusion of these flow paths in the site layout should be investigated at the site design stage.** • **As the site is currently greenfield, the feasibility of infiltration SuDS should also be explored. Contamination testing would also be required.**		

Surface Water Flood Risk from Proposed Development

Proposed development limiting runoff rate in accordance with G2.30 of Welsh SuDS Standards: (l/sec)
Qbar: 13 l/s (FEH Statistical)

Design flood event (incl climate change)	Critical storm duration Hrs	Inflow volume m^3	Outflow volume m^3	Attenuation required m^3	Time to empty (assuming no infiltration) Hrs	Total detention basin storage required: Area (ha) of unlined base and depth (m)
30yr Rainfall+20%	12	2872	393	2479	75.5	0.75 ha 0.33 m
30yr Rainfall+40%	12	3351	393	2958	90.0	0.75 ha 0.39 m
100yr Rainfall+20%	12*	3730	393	3337 (858m3 of exceedance storage)	101.6	0.75 ha 0.44 m
100yr Rainfall+40%	12*	4352	393	3958 (1000m3 of exceedance storage)	120.5	0.75 ha 0.53 m

*limited to corresponding 30yr Rainfall critical storm duration

PE1.5 Greenfield Business Park Phase III	
Climate change	• Application of the central (20%) and upper band (40%) potential change anticipated for climate change in the table above shows the estimated attenuation volumes for the 1% AEP and 3.33% AEP rainfall events.
Surface water: flood risk impacts from development site, mitigation & SuDS	• As part of this appraisal we have included calculations to provide an estimated land take if a detention basin is used to attenuate runoff. In accordance with Table G2.1 of Welsh SuDS Standards, the drained impermeable surface area (assumed 85%) should be less than 5 times the vegetated surface area receiving the runoff. This is equivalent to 17% of the total site. • This provides a high land take estimate. Where infiltration rates are greater than 1x10-6m/s, areas up to 25 times the base area of the basin can be assumed to meet interception requirements. • Further reductions in land take can be achieved by adopting a Long-Term Storage approach (SuDS Standards: G2.30), or through design of green roofs, rainwater harvesting systems and infiltration where appropriate. It is noted that contamination could preclude an unlined basin. • Attenuation volumes are presented for the critical storm duration for the 1 in 30-year events with exceedance flows quantified up to the 1 in 100-year event. To prevent development worsening flood risk elsewhere, surface water runoff must be managed on site.
Overall Site Assessment	
Development suitability	• **100% of the site is within DAM Zone C1, therefore the justification test (Section 6, TAN 15) is required to be applied with the potential consequences of flooding to the site occurring being accepted. Appendices A1.14 and A1.15 of TAN 15 provide indicative guidance on acceptable thresholds for employment (commercial/retail) use.** • **In accordance with Table A1.14 of TAN 15, the development would be expected to be designed to be flood free up to the tidal 0.5% AEP + climate change event. It is clear that any development on this site could not remain flood free and mitigation would be required, were development to take place.** • **In accordance with Table A1.14 of TAN15, the entire site would be expected to be designed to be flood free in the critical 'design' flood event, which in this case is the 0.1% AEP tidal event. It is clear from the Greenfield model outputs that this will not be possible.** • **It is therefore recommended that this site is not developed and is left as open space.** • **Any FCA should be used to model and confirm climate change levels for the critical design event and assess whether land raising could be appropriate. If the option for land raising is not agreeable with NRW then it is difficult to envisage how any development could take place at this site.**

6 PE1.6 Broncoed Industrial Estate

PE1.6 Broncoed Industrial Estate	
Location	Broncoed Industrial Estate, Broncoed, Mold
Site area (ha)	0.7
Watercourse	River Alyn; unnamed tributary of River Alyn
NRW Model used	Mold 2008
Existing use	Greenfield
Existing site flood risk vulnerability classification (TAN 15)	Not classified - open green space
Proposed development flood risk vulnerability classification (TAN 15)	Less vulnerable
Proposed development impermeable area (ha) – *70% based on FCC advice*	0.49

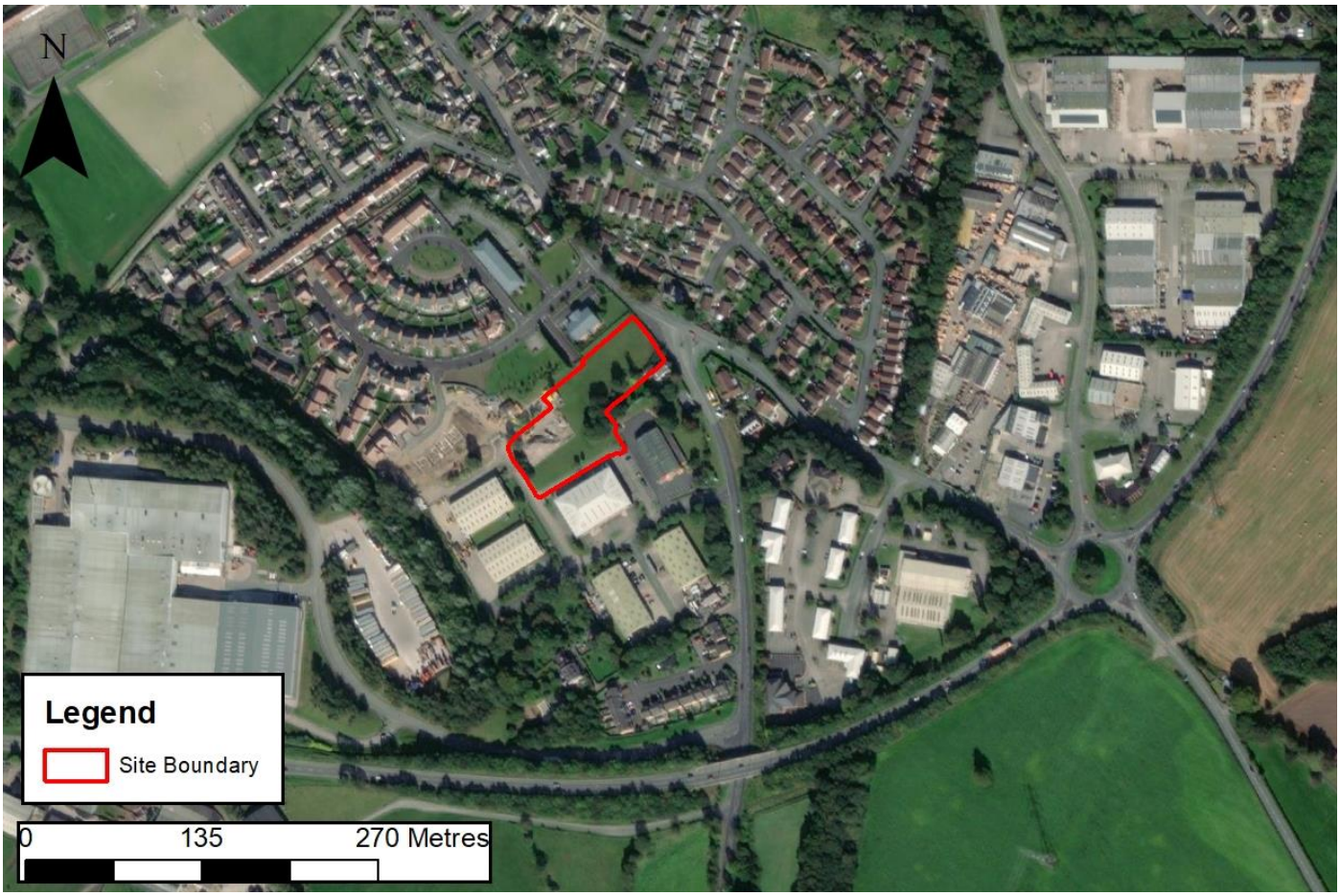


Figure 6-1 Aerial imagery of the site

PE1.6 Broncoed Industrial Estate

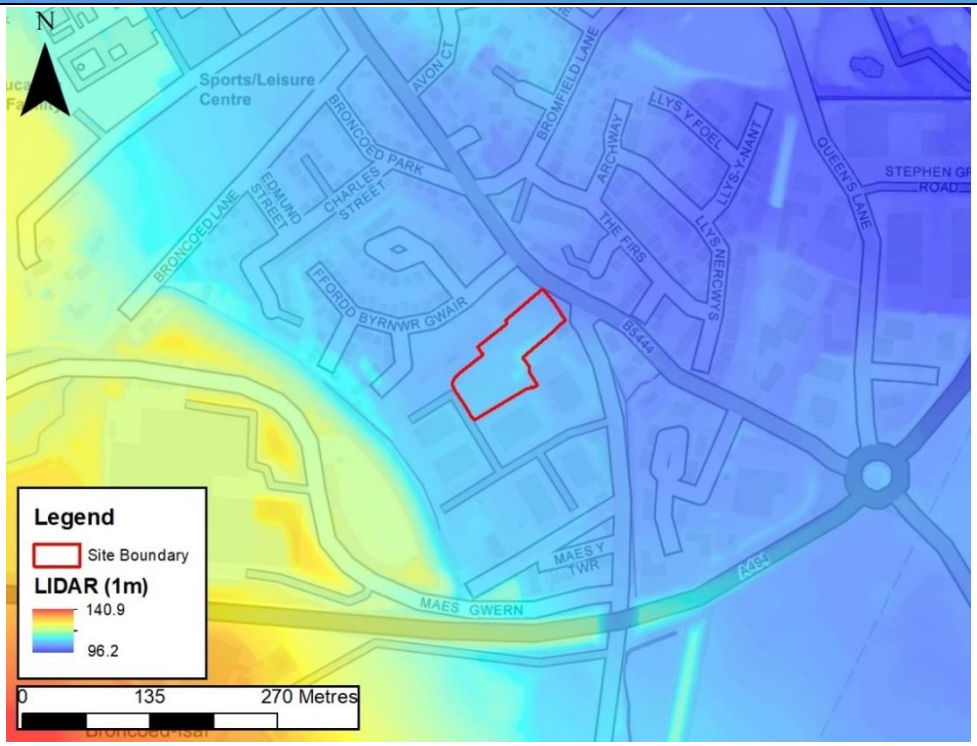


Figure 6-2 Site boundary with 1m LIDAR

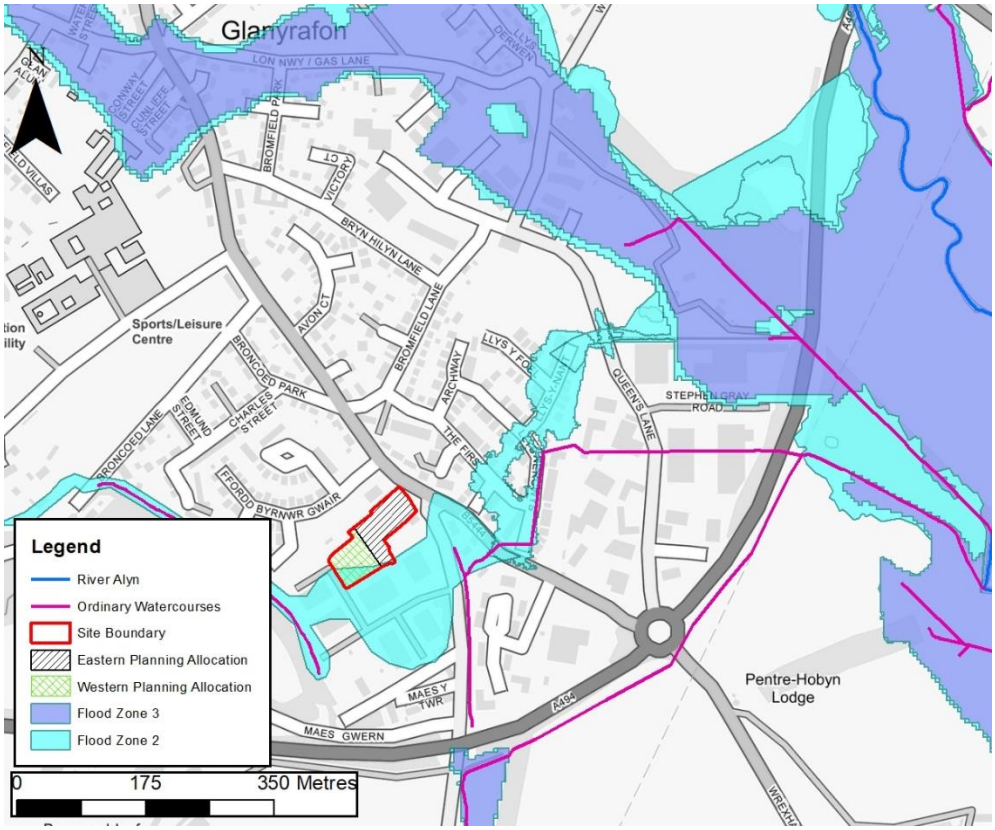


Figure 6-3 Site boundary with NRW Flood Zones 2 and 3 and relevant watercourses

PE1.6 Broncoed Industrial Estate

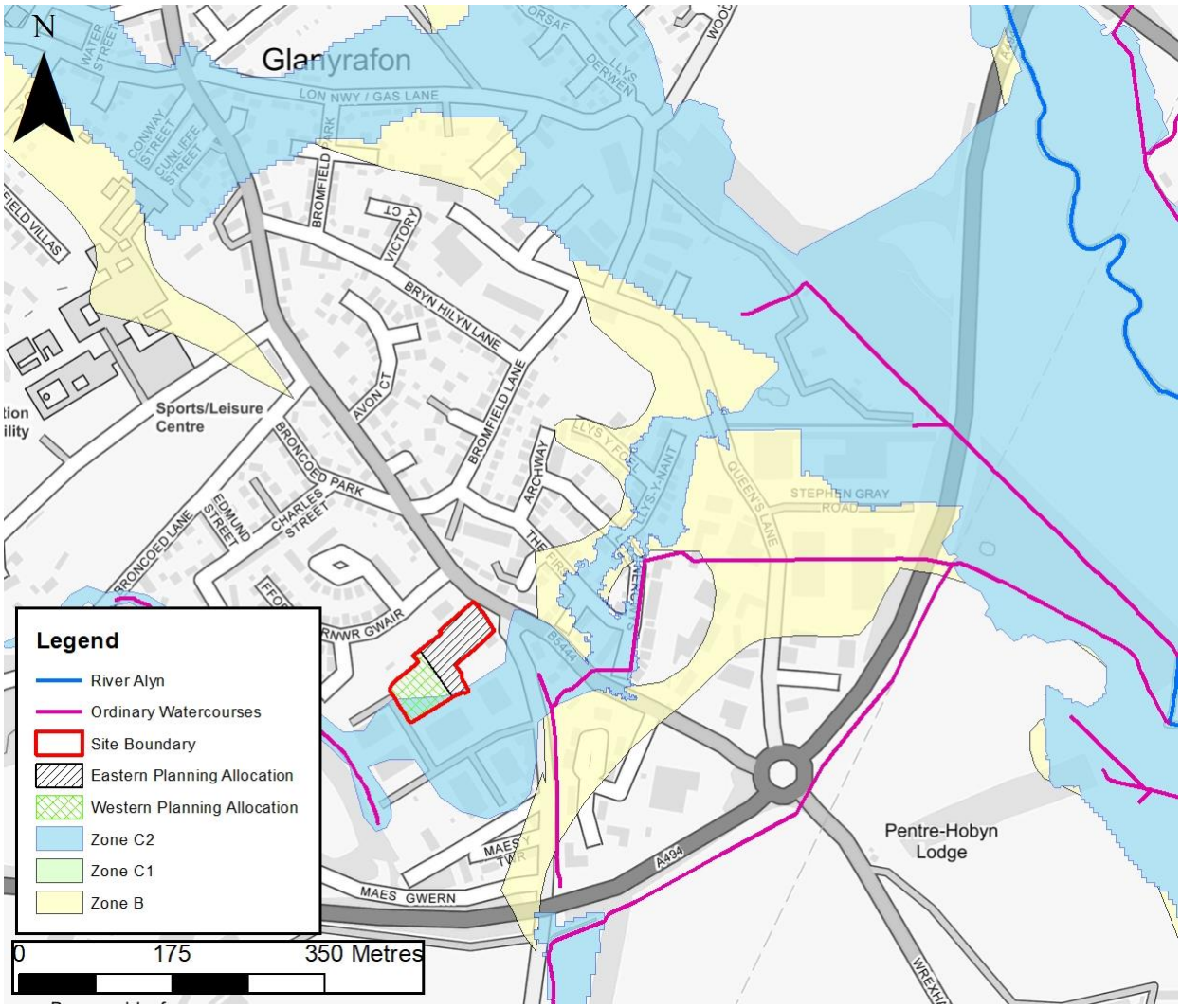


Figure 6-4 Site boundary with DAM mapping

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Key findings from the 2020 Flintshire Strategic Flood Consequence Assessment (SFCA)

- The site is 86% within DAM Zone A, 14% in Zone C2 and 14% in Flood Zone 2.
- The risk appears to be fluvial from the ordinary watercourse tributary of the River Alyn and the ordinary watercourse to the south and west.
- No risk identified from the Dee defence breach scenario modelling; however, this is not to say there is no risk from a defence breach, only that the modelled breach locations do not impact on this site.
- Nominal risk from surface water.
- TAN 15 advice – Plan allocations and applications can only proceed subject to accordance with Section 6 and acceptability of consequences in accordance with Section 7 and Appendix A.
- The eastern part of the allocation has recently been granted planning permission (058968 on 2/10/19) for 20 residential apartments. The planning application was accompanied by a FCA but

PE1.6 Broncoed Industrial Estate			
the Committee Report identified no consultation response from NRW, despite the proposal being for highly vulnerable development. The remaining western part of the allocation, amount to approximately 0.35 ha previously benefitted from planning permission for the erection of light industrial/business units (042134 on 29/11/16).			
Modelled Flood Source: Fluvial*			
Flood Zones (%)	Flood Zone 3	Flood Zone 2	Climate Change
	0	14	n/a
Fluvial: average depth (m)	n/a	n/a	n/a
Fluvial: maximum depth (m)	n/a	n/a	n/a
Fluvial: average hazard	n/a	n/a	n/a
Fluvial: maximum hazard	n/a	n/a	n/a
*Modelled flood outlines unavailable			
Modelled fluvial risk on River Alyn (Mold 2008 model)	• Modelled flood outlines from the Mold 2008 model are modelled to not impact the site. The 0.1% AEP event modelled outline is not modelled to impact the site therefore Flood Zone 2 is not based on the Mold 2008 model. It appears that Flood Zone 2 is based on NRW's Historic Flood Map. • There are two ordinary watercourses located east and west of the site though these are assumed to be unmodelled. These watercourses are in close proximity to the site and may demonstrate a risk of flooding to any potential development, if modelled.		
Historic flooding	• The southern corner of the site is within an outline in the Historic Flood Map dating from October/November 2000. The comment states 'main part of town flooded from River Alyn but other areas were flooded from "backed up" ordinary watercourses i.e. Broncoed and Glanyrafon'.		
Defences	• Based on NRW's Spatial Flood Defences dataset, there are no official manmade defences bordering the River Alyn or any of the smaller, ordinary watercourse near to the development site.		
Flood Alert/Warning Area	• The southern corner of the site overlaps with one Flood Warning Area; listed as 'parts of the town around Leadmill, Queens Park, Brook Street, Gas Lane and Broncoed Industrial Estate'.		
Observations, mitigation options & site suitability: fluvial	• **Risk is shown to be minimal. Based on current modelled information, modelled fluvial risk to the site is very low.** • **At this stage, only the southern corner of the site lies within Flood Zone 2 and DAM Zone C2. The current outlines of Flood Zone 2 and DAM Zone C2 would appear to be based on the Historic Flood Map. As discussed above, the HFM outline states that the historic event that Flood Zone 2 is based on was not caused by the River Alyn, rather the smaller ordinary watercourses becoming blocked.** • **At this stage, any planned development based on the current risk highlighted in this appraisal, should seek to avoid the identified risk area and focus built development to the centre and north of the site.** • **Access and egress should be achievable via Wrexham Road/B5444.** • **Based on the above, it would be prudent for the ordinary watercourses to be modelled as part of the FCA to confirm risk to the site and possible access/egress routes.**		

PE1.6 Broncoed Industrial Estate	
Flood Source: Groundwater	
Flood risk: groundwater	• As the development site is located near to an unnamed ordinary watercourse as well as there being a gradient falling away to the east through the site (Figure 6-2), it is assumed that all groundwater will follow natural topography and flow eastwards. • However, the FCA for the site should include an investigation into ground conditions and infiltration capacities.
Flood Source: Surface Water	
Surface Water Flood Risk to Proposed Development Site	

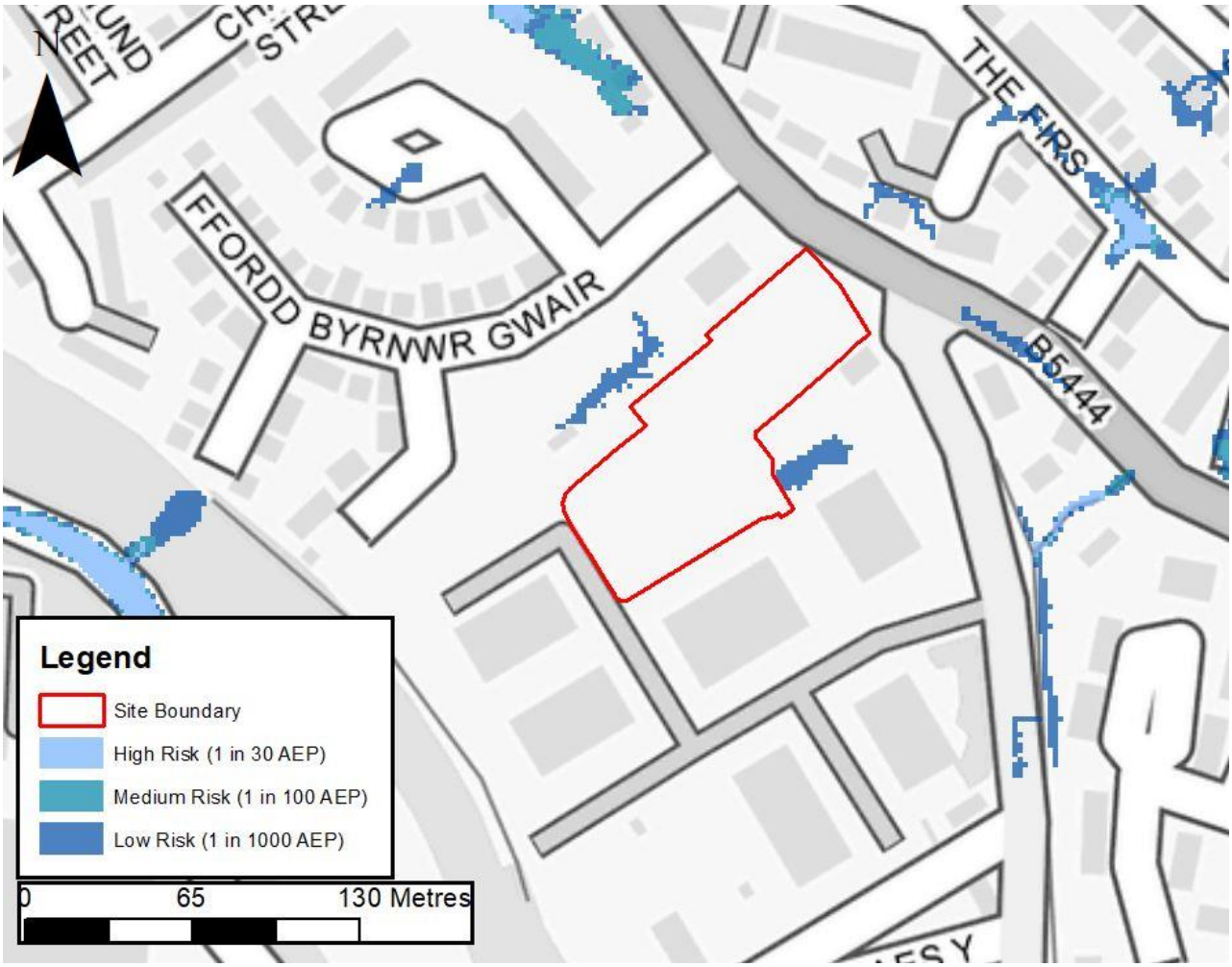

Figure 6-5 Surface water risk to site PE1.6 (NRW Risk of Flooding from Surface Water map)

PE1.6 Broncoed Industrial Estate						
Existing development: Risk of Flooding from Surface Water map (%)	High Risk (1 in 30 AEP)		Medium risk (1 in 100 AEP)		Low risk (1 in 1000 AEP)	
	0.0		0.0		0.02	
Surface water flooding depths	Max: n/a		Max: n/a		Max: 0.9	
Surface water hazards	Max: n/a Mean: n/a		Max: n/a Mean: n/a		Max: Significant Mean: Significant	
Surface water flood risk to development site	• Surface water risk is overall very low onsite and on surrounding access roads. • Surrounding access streets do see slight inundation of surface water risk though main access routes from the site to the B5444 remain mostly clear.					
Climate change	• The current day 0.1% surface water outline provides an indication of the likely increase in extent of more frequent events which Figure 6-5 shows there to be a very low risk to the site in this event.					
Mitigation options & site suitability: surface water	• **Surface water risk is very low and unlikely to be an issue at this site.**					
Surface Water Flood Risk from Proposed Development						
Proposed development limiting runoff rate in accordance with G2.30 of Welsh SuDS Standards: (l/sec) Qbar: 1* l/s (FEH Statistical) *Note that a minimum flow rate of 5l/s may be applied only where there is a risk of throttle outlets being blocked and it can be demonstrated that no alternative practical SuDS arrangement could be used that would reduce this blockage risk.						
Design flood event (incl climate change)	Critical storm duration Hrs	Inflow volume m^3	Outflow volume m^3	Attenuation required m^3	Time to empty (assuming no infiltration) Hrs	Total detention basin storage required: Area (ha) of unlined base and depth (m)
30yr Rainfall+20%	12	487	30	456	180.6	0.12 ha 0.38 m
30yr Rainfall+40%	15	575	38	537	212.7	0.12 ha 0.45 m
100yr Rainfall+20%	12**	625	30	595 (139m3 of exceedance storage)	235.5	0.12 ha 0.50 m
100yr Rainfall+40%	15**	760	38	722 (186m3 of exceedance storage)	285.6	0.12 ha 0.60 m
*limited to corresponding 30yr Rainfall critical storm duration						
Climate change	• Application of the central (20%) and upper band (40%) potential change anticipated for climate change in the table above shows the estimated attenuation volumes for the 1% AEP and 3.33% AEP rainfall events.					

PE1.6 Broncoed Industrial Estate	
Surface water: flood risk impacts from development site, mitigation & SuDS	• As part of this appraisal we have included calculations to provide an estimated land take if a detention basin is used to attenuate runoff. In accordance with Table G2.1 of Welsh SuDS Standards, the drained impermeable surface area (assumed 85%) should be less than 5 times the vegetated surface area receiving the runoff. This is equivalent to 17% of the total site. • This provides a high land take estimate. Where infiltration rates are greater than 1x10-6m/s, areas up to 25 times the base area of the basin can be assumed to meet interception requirements. • Further reductions in land take can be achieved by adopting a Long-Term Storage approach (SuDS Standards: G2.30), or through design of green roofs, rainwater harvesting systems and infiltration where appropriate. It is noted that contamination could preclude an unlined basin. • Attenuation volumes are presented for the critical storm duration for the 1 in 30-year events with exceedance flows quantified up to the 1 in 100-year event. To prevent development worsening flood risk elsewhere, surface water runoff must be managed on site.
Overall Site Assessment	
Development suitability	• **Fluvial risk to the site is unable to be fully quantified due to a lack of available modelled flood extents for the ordinary watercourses nearby to the development. It is recommended that risk from these watercourses be investigated and possibly modelled as part of the FCA. Consultation with NRW will be required.** • **Both current Flood Zone and DAM mapping suggest that the flood risk to the site is based on a historic event. This event being a consequence of blockages of the aforementioned ordinary watercourses rather than from the Main River, River Alyn.** • **Access and egress appear to be achievable via the northern boundary of the site with the B5444/Wrexham Road.** • **At this stage, any planned development based on the current risk highlighted in this appraisal, should seek to avoid the identified risk area and focus built development in the remaining 0.6 ha. The risk area should be left as open green space.** • **As the majority of the site is shown to be at very low risk, it is assumed that development at this site would not adversely affect flood risk elsewhere, assuming development can avoid the risk area which at this stage appears possible.** • **Given the site is within Zone C1, confirmation on the condition, reliability and future maintenance arrangements for the Dee defences should be sought from NRW.** • **The 2020 update to the Strategic Flood Consequence Assessment highlighted that a planning application for 20 residential apartments had been granted for the eastern side of the site. Despite being for highly vulnerable buildings, the eastern area lies outside Flood Zone 2 and DAM Zone C2 and so the justification test would not need to be applied and passed assuming the risk area in the south is avoided.** • **An additional planning application was also submitted for light industrial/business units in the western part of the site. It is unclear if this site area includes land in the southern corner (land within DAM Zone C2) then the justification test (Section 6, TAN 15) needs to be applied with the potential consequences of flooding to the site occurring being accepted. The FCA should account for this.**

7 PE1.8 Adjacent Mostyn Docks

PE1.8 Adjacent Mostyn Docks	
Location	Adjacent Mostyn Docks, Mostyn
Site area (ha)	3.1
Watercourse	River Dee (tidal estuary)
NRW Model used	Dee Tidal 2016
Existing use	Greenfield
Existing site flood risk vulnerability classification (TAN 15)	Not classified - open green space
Proposed development flood risk vulnerability classification (TAN 15)	Less vulnerable
Proposed development impermeable area (ha) – *70% based on FCC advice*	2.17

Figure 7-1 Aerial imagery of the site

PE1.8 Adjacent Mostyn Docks

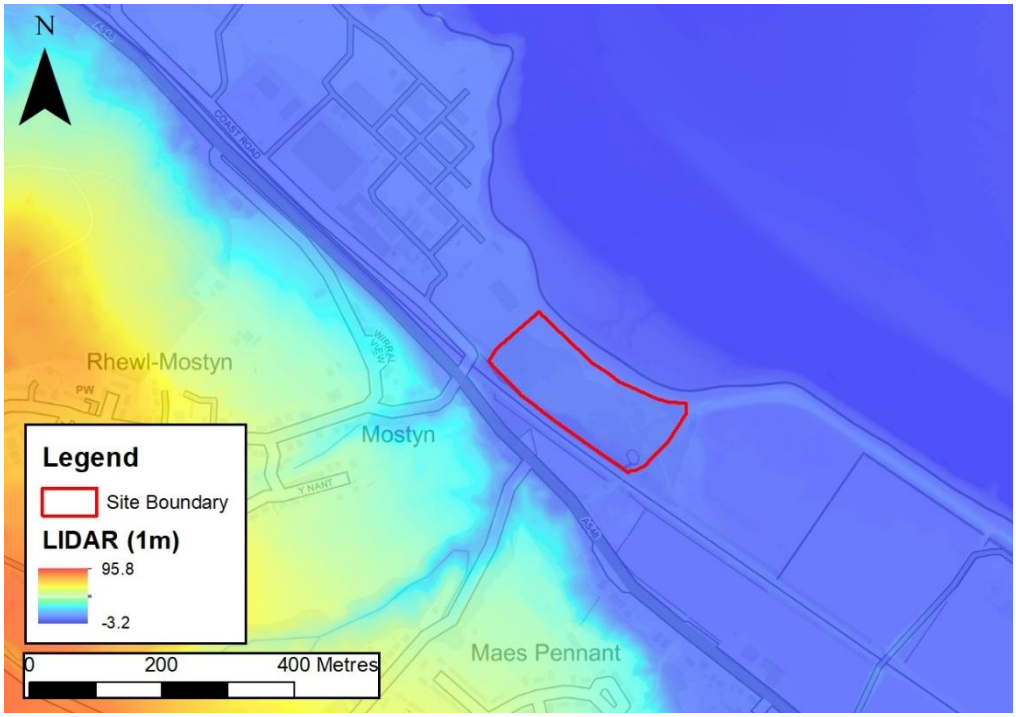

Figure 7-2 Site boundary with 1m LIDAR

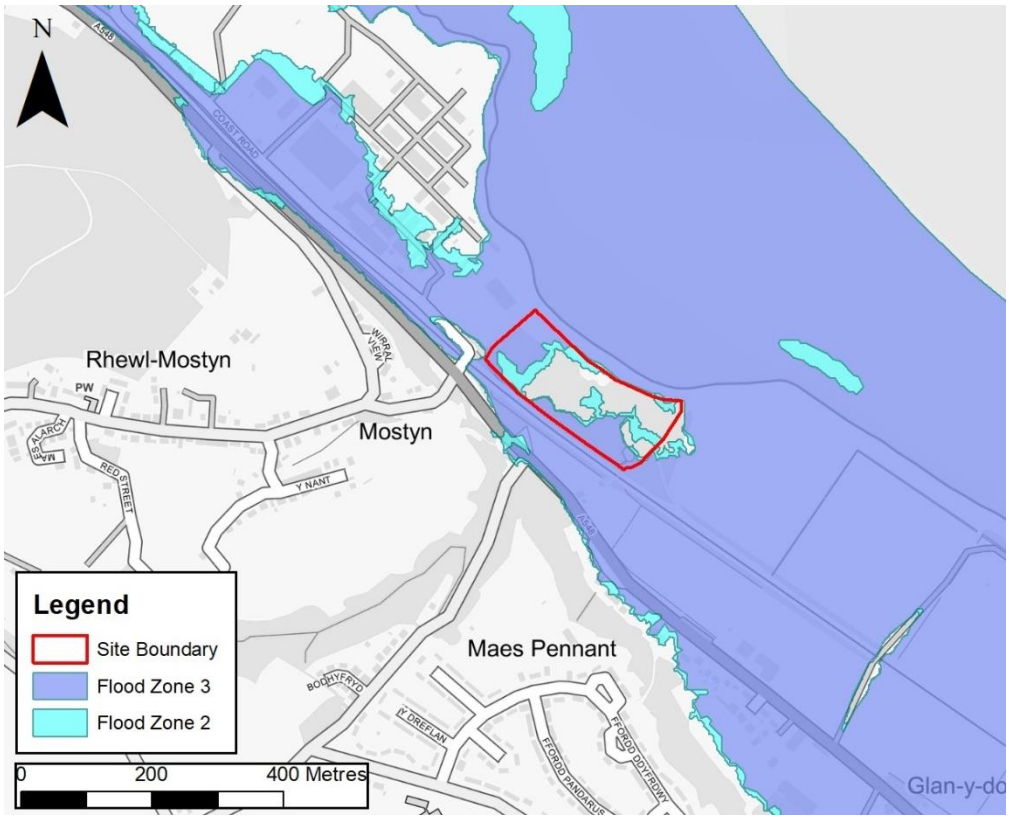

Figure 7-3 Site boundary with NRW Flood Zones 2 and 3

PE1.8 Adjacent Mostyn Docks

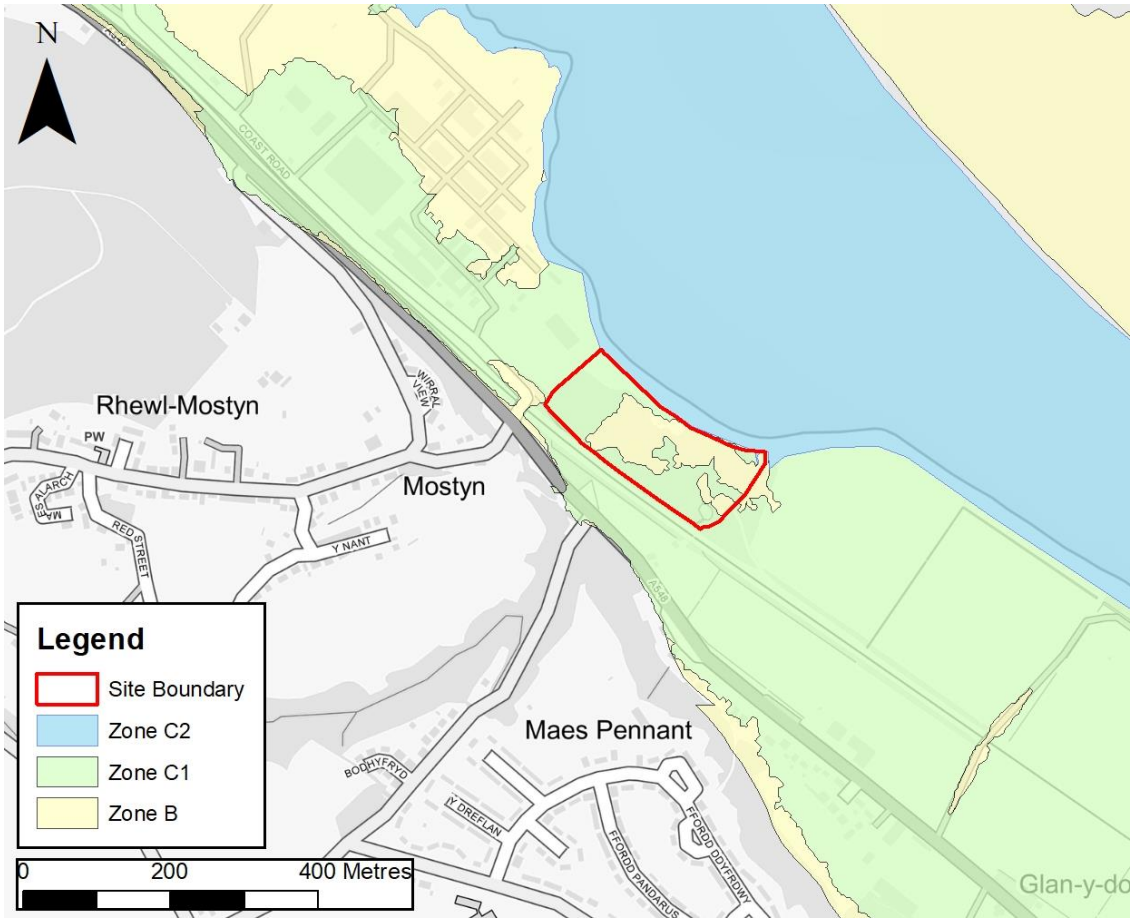

Figure 7-4 Site boundary with DAM mapping

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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earth star Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID. IGN, and the GIS User Community.

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Key findings from the 2020 Flintshire Strategic Flood Consequence Assessment (SFCA)

- Site is 56% within DAM Zone C1, 43% in Zone B, 21% in Flood Zone 2 and 37% in Flood Zone 3.
- The risk is tidal from the River Dee.
- No risk identified from the Dee defence breach scenario modelling; however, this is not to say there is no risk from a defence breach, only that the modelled breach locations do not impact on this site
- TAN 15 advice: Plan allocations and applications can only proceed subject to justification in accordance with Section 6 and acceptability of consequences in accordance with Section 7 and Appendix 1.

PE1.8 Adjacent Mostyn Docks			
Modelled Flood Source: Tidal*			
Flood Zones (%)	Flood Zone 3	Flood Zone 2	Climate Change
	37	21	n/a
Tidal: average depth (m)	n/a	n/a	n/a
Tidal: maximum depth (m)	n/a	n/a	n/a
Tidal: average hazard	n/a	n/a	n/a
Tidal: maximum hazard	n/a	n/a	n/a
*No modelled flood outlines available			

Modelled tidal risk on River Dee	• Modelled flood outlines for the Tidal Dee Estuary are unavailable in this location as they have been recently superseded by the 2018 Coastal Flood Boundary (CFB). This dataset provides extreme sea level values around the coast of the UK. In addition, the 2018 release also included levels for estuaries, the Dee included. In a 0.5% AEP event, the extreme level at this site is 6.11m and 6.36 in a 0.1% AEP event.
Historic flooding	• No part of the site is within NRW's Historic Flood Map.
Defences	• Based on NRW's Spatial Flood Defences dataset, there are two flood embankments located along the Dee Estuary which end at the southern boundary of the site. Of these two, the embankment closest to the Estuary has a of 4/poor with the other having a condition of 3/fair. Both embankments have a standard of protection of 200 years. There are no defences directly between the site and the Estuary though as the site is 43% within DAM Zone C1 it is assumed that the Dee Estuary defence embankments do provide protection to the site.
Flood Alert/Warning Area	• The site lies within one Flood Alert Area and one Flood Warning Area. The FAA being described as 'areas along the North Wales coast from the Dee Estuary to the east coast of Anglesey' and the FWA as 'the communities of Greenfield and Bagillt, from the outskirts of Flint up to Mostyn Docks'.
Observations, mitigation options & site suitability: tidal	• **The flood zones and proximity to the Dee Estuary indicate tidal risk to the site is the primary source of flood risk.** • **Central and eastern areas of the site are in Flood Zone 1 and DAM Zone B, however, these areas are surrounded on all sides by Flood Zone 3 and DAM Zone C1 thus creating a 'dry island'.** • **Current flood risk levels have been extracted from the 2018 Coastal Flood Boundary dataset, though this does not include projected levels across the site. Based on LIDAR (Figure 7-2), average ground levels across the site are between 6.5-7.02m and so much of the site may be above the extreme water levels during a 0.5% and 0.1% AEP event, cited above.** • **As modelling outputs are unavailable, depths and hazards cannot be ascertained. It is therefore difficult to advise on development viability. This information will be required as part of the site-specific FCA.** • **The 2018 Coastal Flood Boundary dataset has been derived from a base year of 2017 so as with Greenfield, an increase of 11mm is required to provide the level for 2020. For climate change this would calculate to a rise of 740mm and 812.5mm for a 75 year (2095) and 100 year (2100) increase respectively.** • **In accordance with Table A1.14 of TAN 15, the development would be expected to be designed to be flood free up to the tidal 0.5% AEP**

PE1.8 Adjacent Mostyn Docks	
	+ climate change event, which at this stage is unknown given the absence of modelling. Further evidence, through the FCA, is required to determine whether the flood defences in place can ensure the site can remain flood free. • **As the source of risk is tidal, land raising may be appropriate, without having to find room for compensatory storage. However, displaced water would have to be controlled and directed back into the Dee so as to not increase risk elsewhere. The appropriateness of this approach would have to be discussed and agreed with NRW.** • **The FCA should include climate change modelling to fully quantify the risk to the site and to confirm requirements for finished floor levels. Based on Table A1.15 of TAN 15, development is not advisable where flood depths exceed 600mm.** • **Safe access/egress routes will be difficult to achieve based on current available information. The FCA will be required to identify safe routes.** • **The FCA will need to include an assessment of ground conditions and suitability for infiltration SuDS through a hydrogeological investigation.** • **A suitable emergency plan should also accompany the FCA, detailing evacuation routes and procedures in the event of a flood.**
Flood Source: Groundwater	
Flood risk: groundwater	• Due to the site's proximity to the Dee Estuary, it is assumed that groundwater levels will follow the natural topography and flow north-eastwards towards the estuary. • The site-specific FCA should fully investigate ground conditions.

PE1.8 Adjacent Mostyn Docks			
Flood Source: Surface Water			
Surface Water Flood Risk to Proposed Development Site			

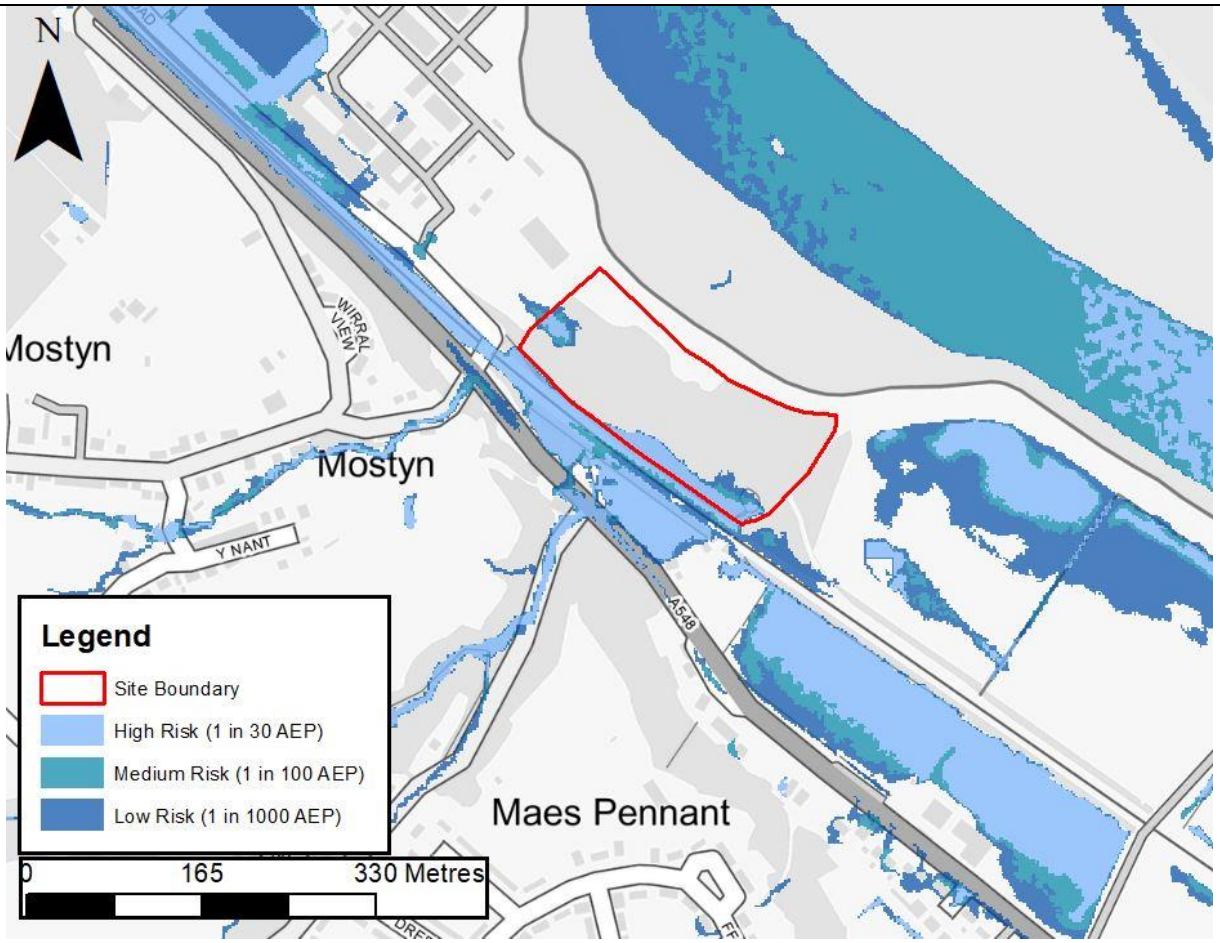

Figure 7-5 Surface water risk to site PE1.8 (NRW Risk of Flooding from Surface Water map)

Existing development: Risk of Flooding from Surface Water map (%)	High Risk (1 in 30 AEP)	Medium risk (1 in 100 AEP)	Low risk (1 in 1000 AEP)
	8.5	10.4	13.8
Surface water flooding depths	Max: 1.6	Max: 1.9	Max: 2.1
Surface water hazards	Max: Significant Mean: Significant	Max: Significant Mean: Significant	Max: Significant Mean: Significant
Surface water flood risk to development site	• Surface water risk is concentrated along the south-west site boundary where areas of the site are impacted during the high, medium and low risk events cutting off access to the site from the A548 access road.		
Climate change	• The current day 0.1% surface water outline provides an indication of the likely increase in extent of more frequent events (Figure 7-5) indicating the effect of climate change on current surface water flood risk may not be significant.		
Mitigation options & site	• **The national Risk of Flooding from Surface Water is not suitable for providing site-specific advice. The FCA should therefore investigate**		

PE1.8 Adjacent Mostyn Docks	
suitability: surface water	**surface water risk further through an outline drainage strategy.** • **Any proposed development should look to avoid the 1% AEP outline at least.** • **With the area along the south-western site boundary, SuDS measures, i.e. swales, incorporation of a blue-green corridor, should be further explored as to whether the surface water risk along this flow path can be effectively managed. Ideally, natural flow paths should be left to flow and remain free of obstruction. The inclusion of these flow paths in the site layout should be investigated at the site design stage.** • **As the site is currently greenfield, the feasibility of infiltration SuDS should also be explored. Contamination testing would also be required.** • **The main access route from the A548 road is at high risk meaning safe access and egress routes for the site may not always be possible. The FCA and drainage strategy should investigate and identify safe routes.**

Surface Water Flood Risk from Proposed Development

Proposed development limiting runoff rate in accordance with G2.30 of Welsh SuDS Standards: (l/sec)
Qbar: 11 l/s (FEH Statistical)

Design flood event (incl climate change)	Critical storm duration Hrs	Inflow volume m^3	Outflow volume m^3	Attenuation required m^3	Time to empty (assuming no infiltration) Hrs	Total detention basin storage required: Area (ha) of unlined base and depth (m)
30yr Rainfall+20%	12	2034	333	1702	61.2	0.53 ha 0.32 m
30yr Rainfall+40%	12	2373	333	2041	73.4	0.53 ha 0.39 m
100yr Rainfall+20%	12*	2639	333	2306 (604m3 of exceedance storage)	83.0	0.53 ha 0.44 m
100yr Rainfall+40%	12*	3079	333	2746 (705m3 of exceedance storage)	98.8	0.52 ha 0.52 m

*limited to corresponding 30yr Rainfall critical storm duration

Climate change	• Application of the central (20%) and upper band (40%) potential change anticipated for climate change in the table above shows the estimated attenuation volumes for the 1% AEP and 3.33% AEP rainfall events.
Surface water: flood risk impacts from development site, mitigation & SuDS	• As part of this appraisal we have included calculations to provide an estimated land take if a detention basin is used to attenuate runoff. In accordance with Table G2.1 of Welsh SuDS Standards, the drained impermeable surface area (assumed 85%) should be less than 5 times the vegetated surface area receiving the runoff. This is equivalent to 17% of the

PE1.8 Adjacent Mostyn Docks	
	total site. • This provides a high land take estimate. Where infiltration rates are greater than 1x10-6m/s, areas up to 25 times the base area of the basin can be assumed to meet interception requirements. • Further reductions in land take can be achieved by adopting a Long-Term Storage approach (SuDS Standards: G2.30), or through design of green roofs, rainwater harvesting systems and infiltration where appropriate. It is noted that contamination could preclude an unlined basin. • Attenuation volumes are presented for the critical storm duration for the 1 in 30-year events with exceedance flows quantified up to the 1 in 100-year event. To prevent development worsening flood risk elsewhere, surface water runoff must be managed on site.
Overall Site Assessment	
Development suitability	• **Over half of the site is within DAM Zone C1, therefore the justification test (Section 6, TAN 15) is required to be applied with the potential consequences of flooding to the site occurring being accepted. Appendices A1.14 and A1.15 of TAN 15 provide indicative guidance on acceptable thresholds for employment (commercial/retail) use.** • **The tidal risk to the site cannot be fully quantified due to a lack of available modelled flood data for the Dee Estuary.** • **Therefore, at this stage, based on current information and in the absence of detailed modelling, it is recommended that this site is not developed and is left as open space.** • **However, to proceed further with developing this site, a site-specific FCA must be carried out to fully quantify the tidal risk from the Dee, accounting for the defences and climate change.**

8 PE1.10 Antelope Industrial Estate

PE1.10 Antelope Industrial Estate	
Location	Antelope Industrial Estate
Site area (ha)	1.2 (in two separate parcels)
Watercourse	Dolfechlas Brook
NRW Model used	Rhydymwyn 2011
Existing use	Greenfield
Existing site flood risk vulnerability classification (TAN 15)	Not classified - open green space
Proposed development flood risk vulnerability classification (TAN 15)	Less vulnerable
Proposed development impermeable area (ha) – *70% based on FCC advice*	0.84

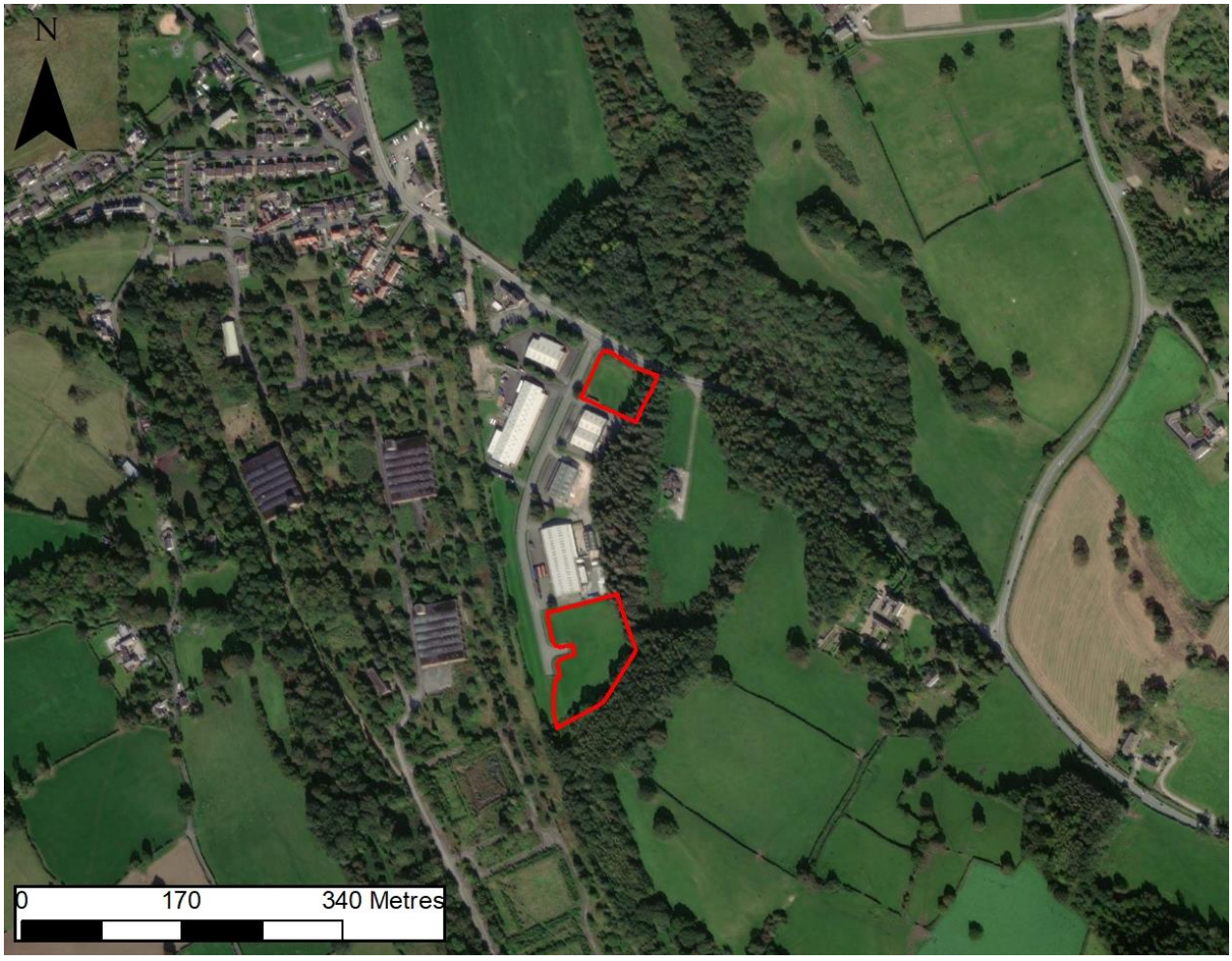

Figure 8-1 Aerial imagery of the site

PE1.10 Antelope Industrial Estate

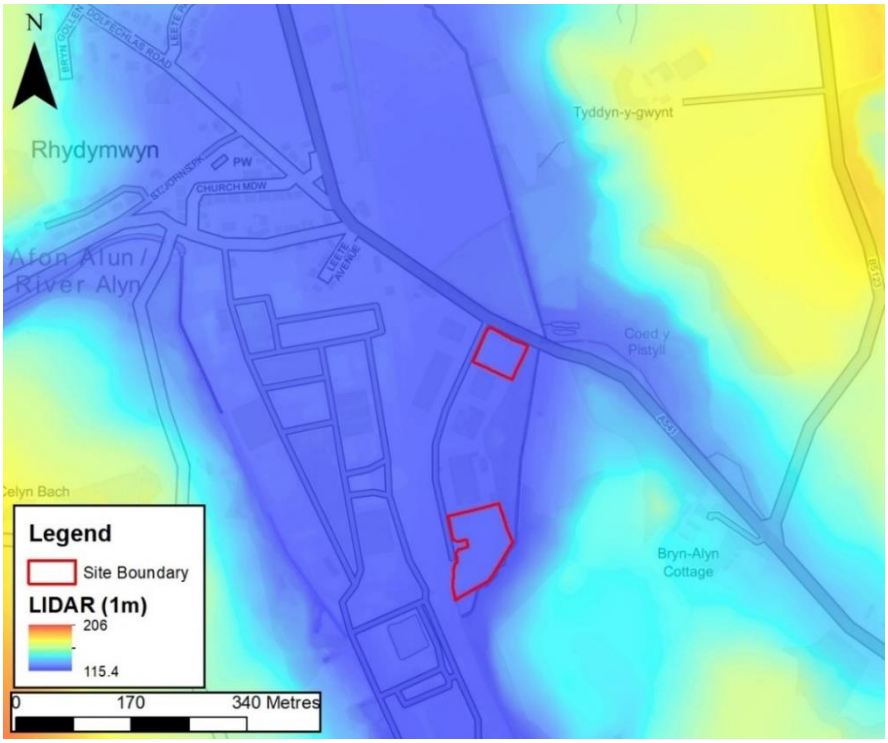

Figure 8-2 Site boundary with 1m LIDAR

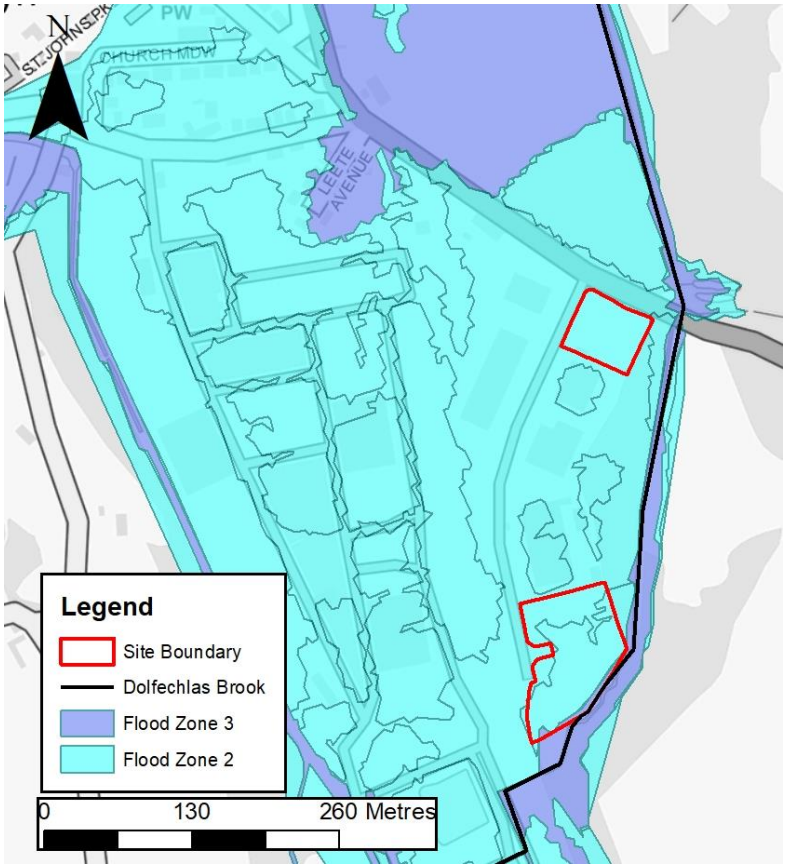

Figure 8-3 Site boundary with NRW Flood Zones 2 and 3

PE1.10 Antelope Industrial Estate

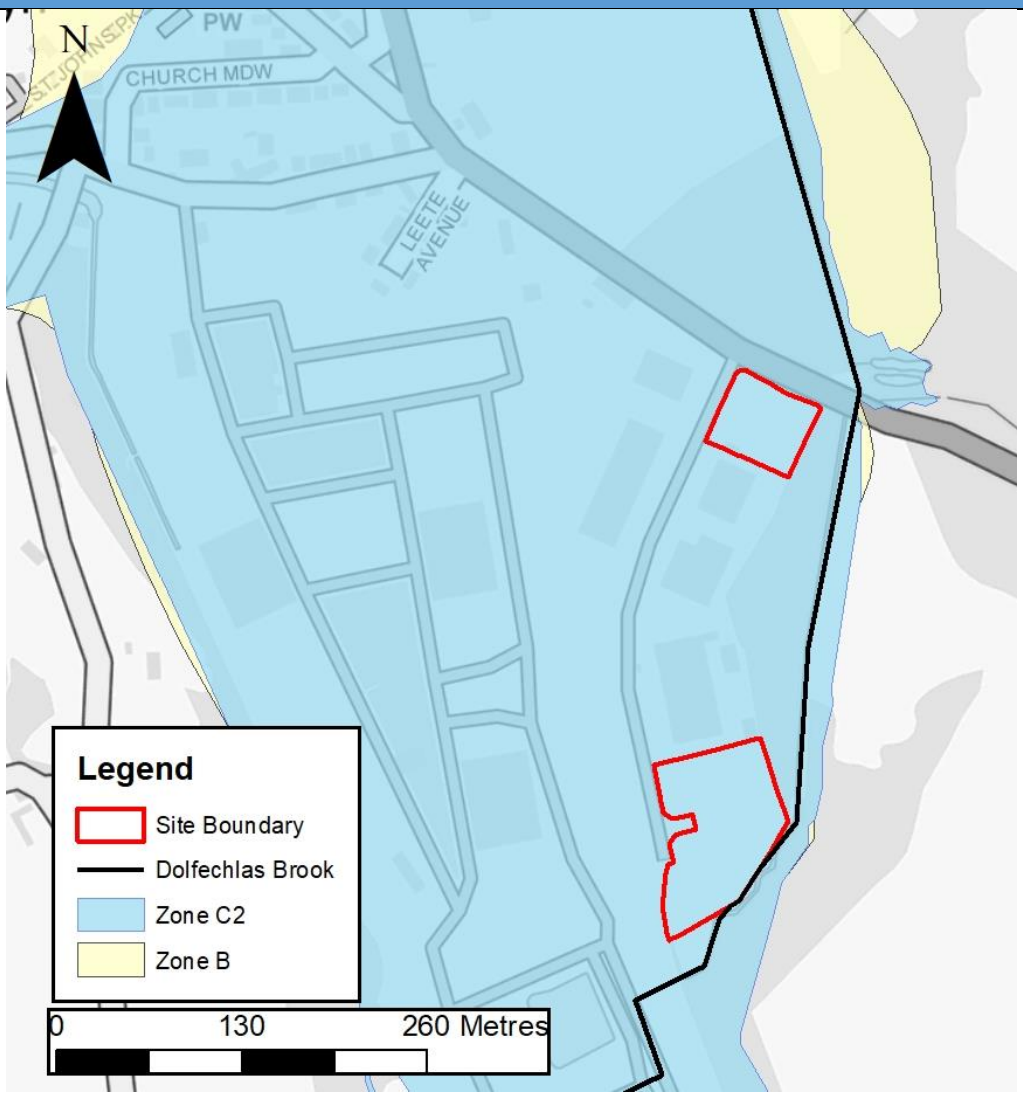

Figure 8-4 Site boundary with DAM mapping

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Key findings from the 2020 Flintshire Strategic Flood Consequence Assessment (SFCA)

- The site is 100% within DAM Zone C2 and Flood Zone 2.
- The risk is fluvial from Dolfechlas Brook; a tributary of the River Alyn. Flood Zone 2 is based on unclear sources (fluvial/tidal/coastal/undefined events) though due to the site's location in regard to the Dee Estuary, fluvial is presumed to be the main source of risk.
- Tidal risk from the Dee does not appear to impact the site, nor does the Dee defence breach scenario modelling; however, this is not to say there is no risk from a defence breach, only that the modelled breach locations do not impact on this site.
- Surface water risk is nominal.
- TAN 15 advice: Plan allocations and applications can only proceed subject to justification in accordance with Section 6 and acceptability of consequences in accordance with Section 7 and

PE1.10 Antelope Industrial Estate			
Appendix 1.			
Modelled Flood Source: Fluvial*			
Flood Zones (%)	Flood Zone 3	Flood Zone 2	Climate Change
	4	100	7
Fluvial: average depth (m)	0.4	0.2	0.6
Fluvial: maximum depth (m)	1.5	2.5	2.3
Fluvial: average hazard	Moderate	Moderate	Significant
Fluvial: maximum hazard	Extreme	Extreme	Extreme
*Based on Rhydymwyn 2011 modelled flood outputs			

Modelled fluvial risk including climate change on Dolfechlas Brook

- This assessment shall refer to the northern most site parcel as parcel 1 and the southernmost as parcel 2.
- Fluvial risk to the site, modelled from Dolfechlas Brook, is modelled to slightly impact on the south eastern boundary of parcel 2 during the 1% AEP undefended and 1% AEP defended events, as seen in Figure 8-5. Parcel 1 remains unaffected by fluvial flooding in the modelled 1% AEP defended and undefended scenarios.

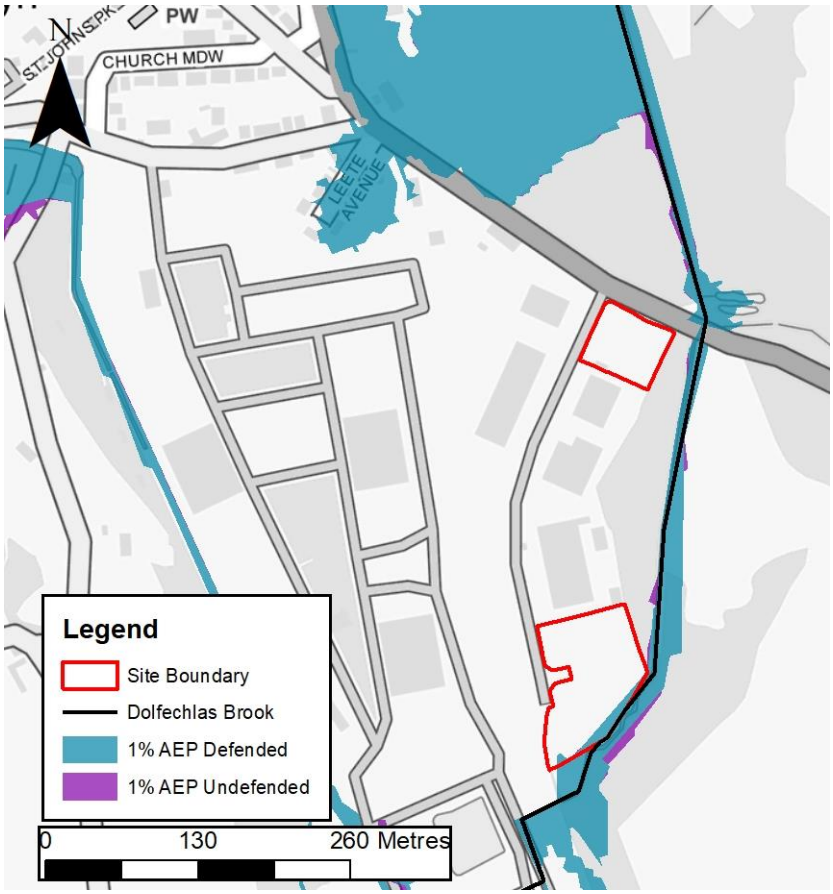


Figure 8-5 Modelled fluvial risk from Dolfechlas Brook (1% AEP defended and undefended events)

- Figures 8-6 and 8-7 indicate that flood depths to the site are significant reaching up to 1.9m in the undefended and 2.3m in the defended along the south-eastern boundary of parcel 2. As Dolfechlas Brook flows alongside

the eastern boundary of parcel 2 it is likely that these depths are in channel and not on riparian land/within the site.

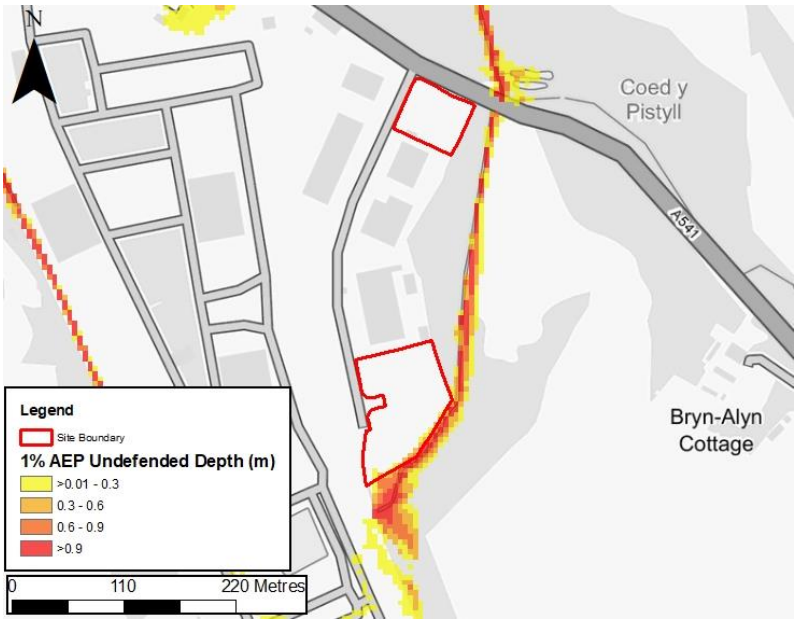


Figure 8-6 Modelled fluvial depths to the site from Dolfechlas Brook (1% AEP undefended)

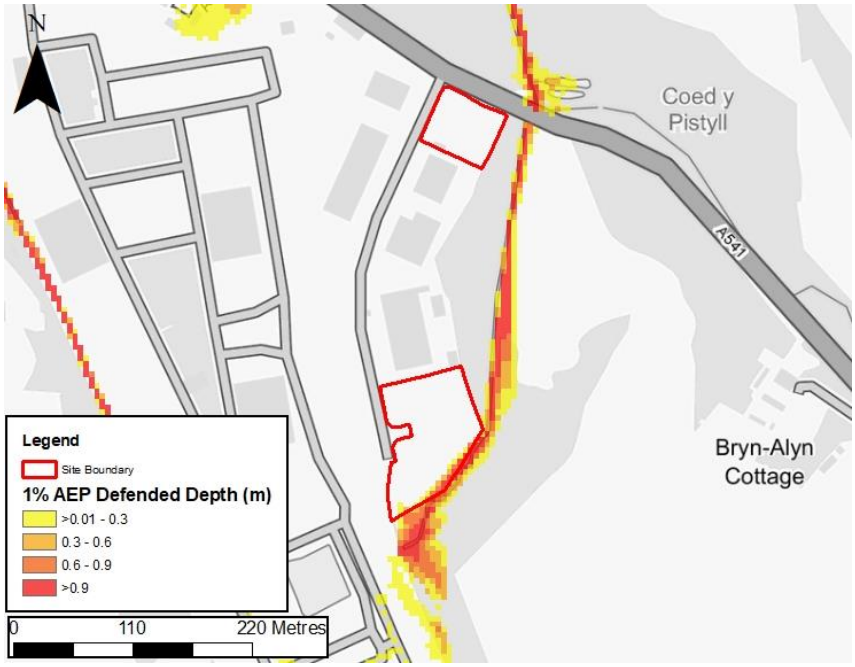
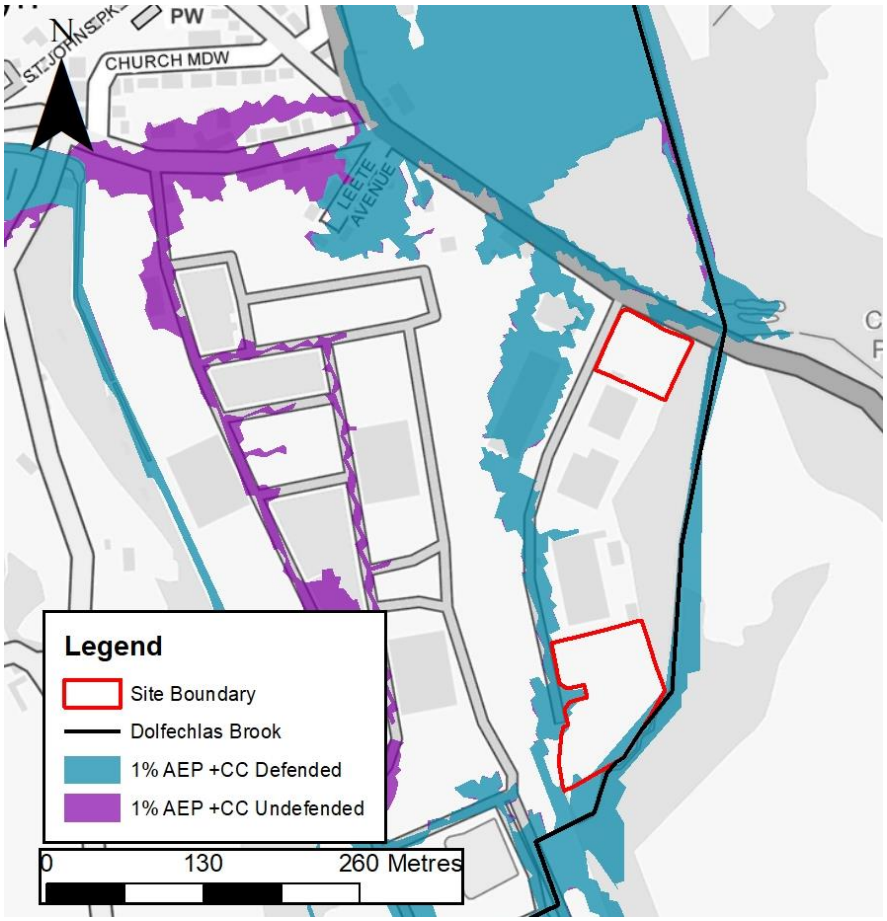


Figure 8-7 Modelled fluvial depths to the site from Dolfechlas Brook (1% AEP defended)

- The effects of climate change are minimal with only a small increase in risk to the same area. (See Figure 8-8).
- The northern section of parcel 2 remains unaffected by fluvial flooding in the 1% AEP +CC defended and undefended scenarios.

PE1.10 Antelope Industrial Estate	
	 **Figure 8-8 Modelled fluvial depths to the site from Dolfechlas Brook (1% AEP +CC undefended and defended)** • Figure 8-9 indicates that flood depths to the site are up to 2.3m (in channel) in the undefended along the south-eastern boundary of parcel 2.

In which case, on-site flood depths are modelled to be low during this event.

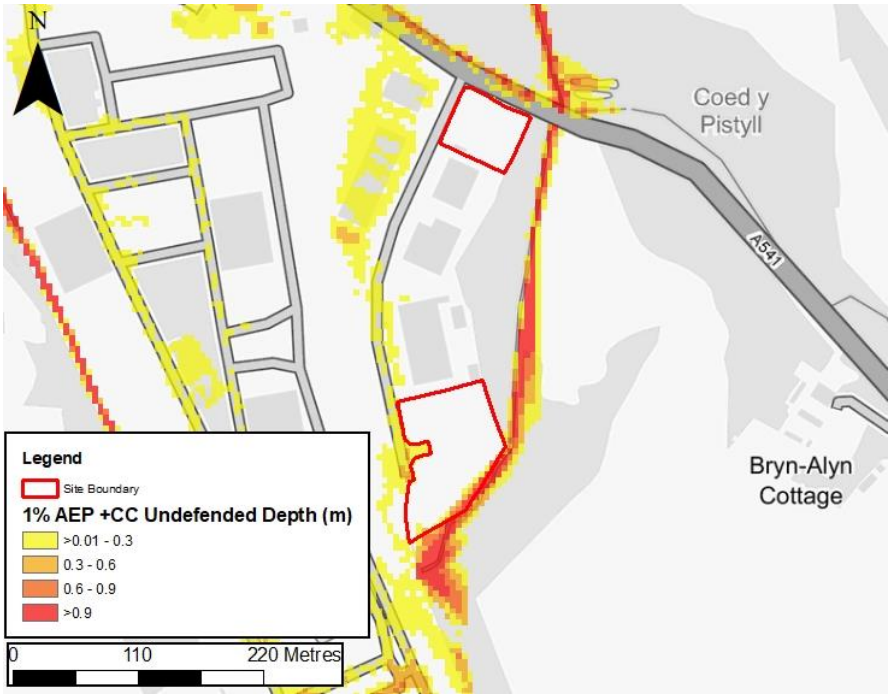
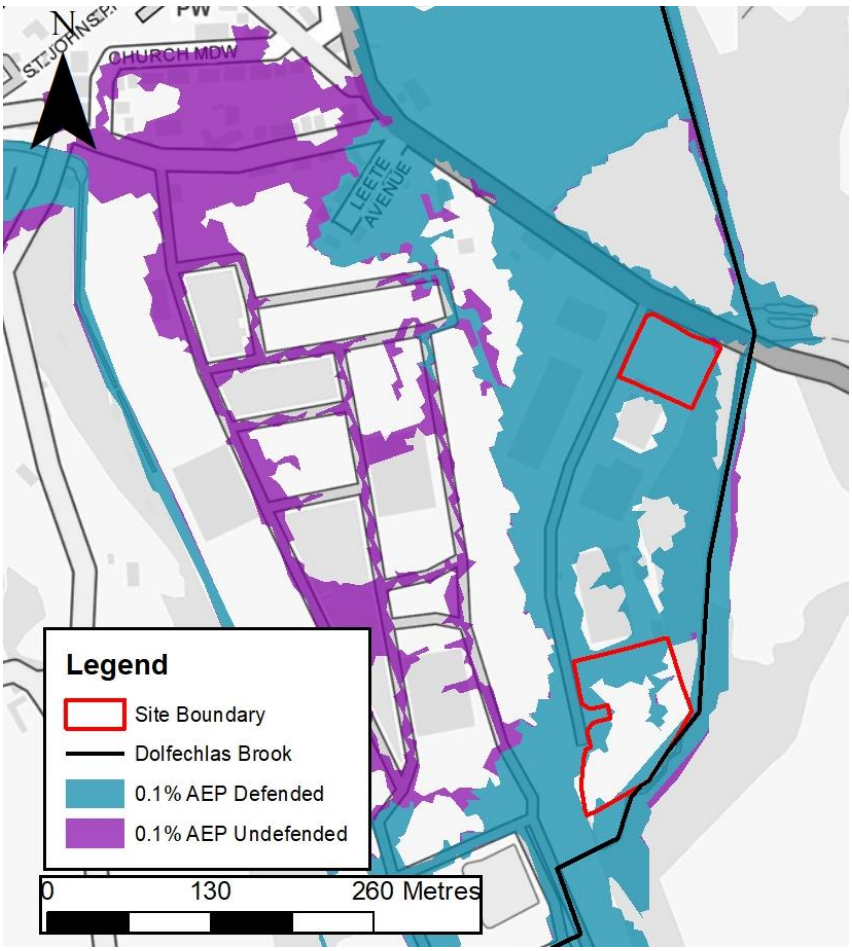
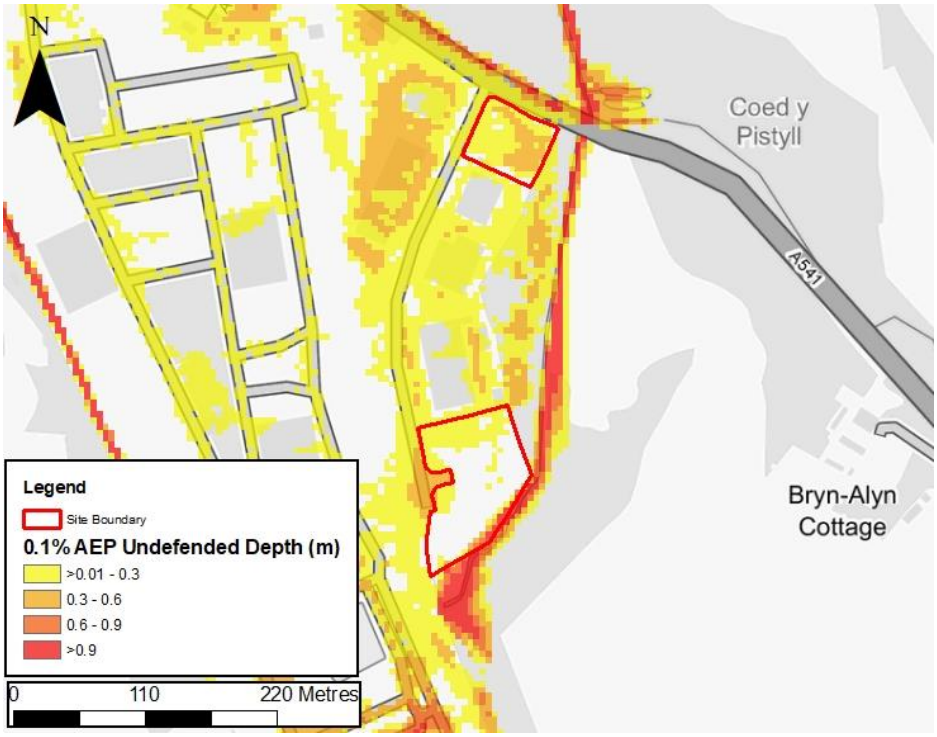


Figure 8-9 Modelled fluvial depths to the site from Dolfechlas Brook (1% AEP +CC undefended)

- There is considerable fluvial risk from Dolfechlas Brook to the site during the 0.1% AEP undefended and 0.1% AEP defended events (Figure 8-10). Modelled fluvial risk is shown to impact almost all of parcel 1 in both the defended and undefended scenarios. Within parcel 2, fluvial risk occurs along the south-eastern, western and northern boundaries of the site, with flood outlines extending into the centre of the site from the north.
- The 0.1% AEP event modelled flood outline is not consistent with Flood Zone 2, indicating that the flood zones are not based on the modelling. It appears that Flood Zone 2 is based on NRW's Historic Flood Map rather than the modelling.

PE1.10 Antelope Industrial Estate	
	 **Figure 8-10 Modelled fluvial risk from Dolfechlas Brook (0.1% AEP undefended and defended)** • Figures 8-11 indicate that, in parcel 1, flood depths to the site are ≤0.5m in both the undefended and defended scenarios. • In parcel 2, flood depths are highest along the south-eastern boundary, with depths of up to 2m in the undefended scenario and 2.5m in the defended scenario. These higher values are again assumed to be in-channel based on the mapping in Figure 8-11. Flood depths within parcel 2 would then appear to be on average between 0.01-0.3m. Parcel 1 however sees greater flood risk with depths between 0.3-0.6m. • The model does not contain a climate change scenario for the 0.1% AEP event.

PE1.10 Antelope Industrial Estate	
	 **Figure 8-11 Modelled fluvial depths to the site from Dolfechlas Brook (0.1% AEP undefended)**
Historic flooding	• The site lies within NRW's Historic Flood Map (HFM). The site is entirely within a historic flood event dating from November 2000 which appears to be the main source of Flood Zone 2.
Defences	• Based on NRW's Spatial Flood Defences dataset, there are no flood defences located close to the site.
Flood Alert/Warning Area	• The site lies wholly within one NRW Flood Warning Area, described as 'parts of the village, including Church Meadow, Nant Alyn road, Leete Avenue and the industrial estate'.
Observations, mitigation options & site suitability: fluvial	• **The site is 100% within DAM Zone C2 and Flood Zone 2. Flood Zone 3 impacts the south-eastern boundary of parcel 2.** • **The 0.1% AEP event modelled flood outline is not consistent with Flood Zone 2 and appears to be based on NRW's Historic Flood Map.** • **Given the whole site is within DAM Zone C2, the justification test (Section 6, TAN 15) is required to be applied with the potential consequences of flooding to the site occurring being accepted.** • **Modelled fluvial risk from Dolfechlas Brook highlights the site is impacted by flooding in the 1% AEP, 1% AEP +CC and 0.1% AEP events. However, the 1% AEP and 1% AEP +CC events largely remain in channel. The 0.1% AEP event represents the critical design event for both parcels though climate change has not been modelled for the extreme event.** • **In accordance with Table A1.14 of TAN 15, the development would be expected to be designed to be flood free up to the fluvial 1% AEP + climate change event. However, the extreme 0.1% AEP event is shown to impact both land parcels, significantly for parcel 1. It is possible Parcel 2 could achieve flood free development and ancillary**

PE1.10 Antelope Industrial Estate	
	areas such as car parking could be situated in the risk areas where depths are shown to generally be low (<300mm). • **Further modelling would have to show that flood risk would not be exacerbated elsewhere by suitable design drainage systems for any car parking areas.** • **The FCA should include climate change modelling for the 0.1% AEP event to fully quantify the risk to the site and to confirm requirements for finished floor levels. Based on Table A1.15 of TAN 15, development is not advisable where flood depths exceed 600mm.** • **Access/egress routes are restricted during the 1% AEP +CC and 0.1% AEP event on Dolfechlas Brook with depths of 0.58m modelled on the A541 and the unnamed Antelope Industrial Estate access road. Safe access/egress routes would need to be shown to be achievable during these extreme events.** • **A suitable emergency plan should also accompany the FCA, detailing evacuation routes and procedures in the event of a flood.**
Flood Source: Groundwater	
Flood risk: groundwater	• Due to the site's proximity to Dolfechlas Brook, the groundwater levels are likely to be similar to the corresponding levels in the river. Groundwater follows topography and is unlikely to be an issue in this instance. • However, the FCA for the site should include an investigation into ground conditions and infiltration capacities.

PE1.10 Antelope Industrial Estate			
Flood Source: Surface Water			
Surface Water Flood Risk to Proposed Development Site			

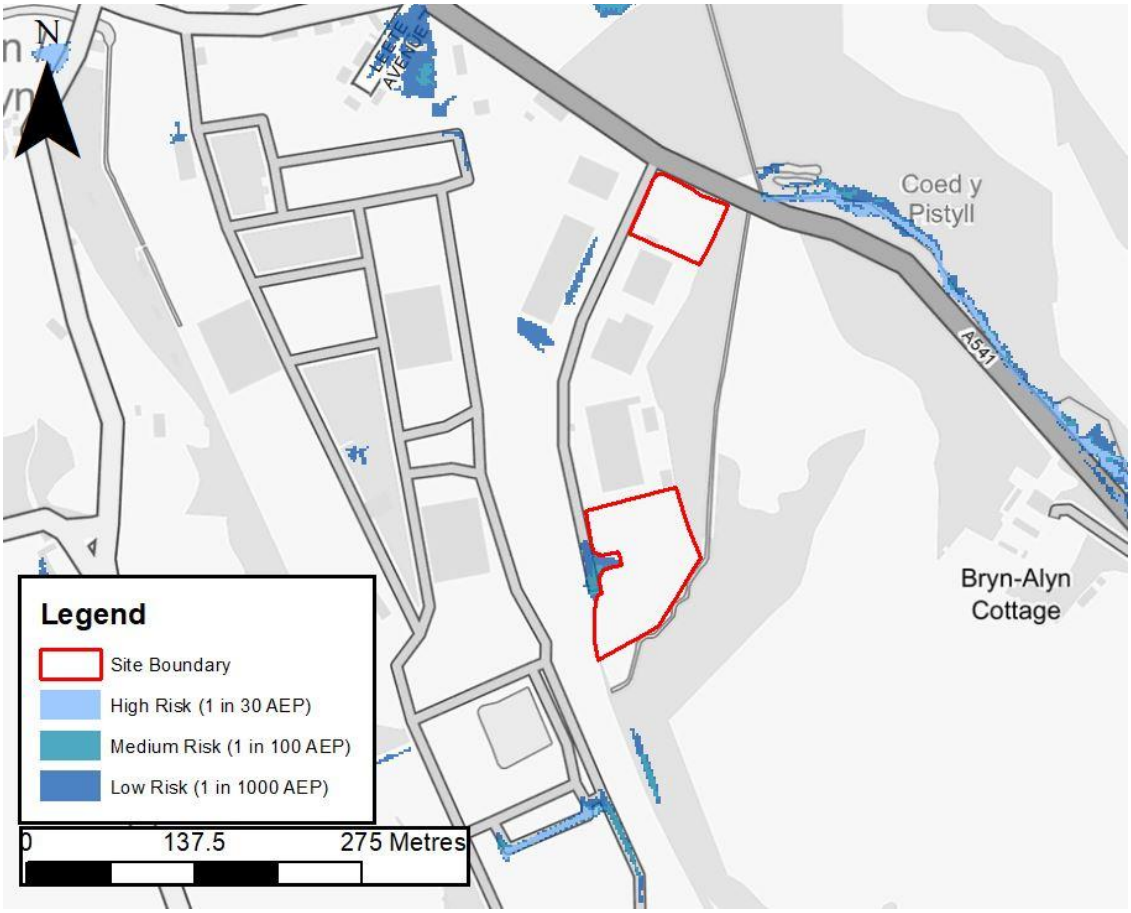



Figure 8-12 Surface water risk to site PE1.8 (NRW Risk of Flooding from Surface Water map)			
Existing development: Risk of Flooding from Surface Water map (%)	High Risk (1 in 30 AEP)	Medium risk (1 in 100 AEP)	Low risk (1 in 1000 AEP)
	n/a	n/a	0.2
Surface water flooding depths	Max: n/a	Max: n/a	Max: 0.3
Surface water hazards	Max: n/a Mean: n/a	Max: n/a Mean: n/a	Max: Moderate Mean: Low
Surface water flood risk to development site	• Surface water risk to both land parcels is nominal.		
Climate change	• The current day 0.1% surface water outline provides an indication of the likely increase in extent of more frequent events which. Figure 8-12 shows there to be a very low risk to the site in this event.		
Mitigation options & site suitability:	• **Surface water risk is very low and unlikely to be an issue at this site.**		

PE1.10 Antelope Industrial Estate						
surface water						
Surface Water Flood Risk from Proposed Development						
Proposed development limiting runoff rate in accordance with G2.30 of Welsh SuDS Standards: (l/sec) Qbar: 3* l/s (FEH Statistical) *Note that a minimum flow rate of 5l/s may be applied only where there is a risk of throttle outlets being blocked and it can be demonstrated that no alternative practical SuDS arrangement could be used that would reduce this blockage risk.						
Design flood event (incl climate change)	Critical storm duration Hrs	Inflow volume m^3	Outflow volume m^3	Attenuation required m^3	Time to empty (assuming no infiltration) Hrs	Total detention basin storage required: Area (ha) of unlined base and depth (m)
30yr Rainfall+20%	12	850	91	759	100.1	0.20 ha 0.38 m
30yr Rainfall+40%	12	992	91	901	118.8	0.20 ha 0.45 m
100yr Rainfall+20%	12**	1087	91	996 (237m3 of exceedance storage)	131.4	0.20 ha 0.50 m
100yr Rainfall+40%	12**	1268	91	1178 (277m3 of exceedance storage)	155.3	0.20 ha 0.59 m
*limited to corresponding 30yr Rainfall critical storm duration						
Climate change	• Application of the central (20%) and upper band (40%) potential change anticipated for climate change in the table above shows the estimated attenuation volumes for the 1% AEP and 3.33% AEP rainfall events.					
Surface water: flood risk impacts from development site, mitigation & SuDS	• As part of this appraisal we have included calculations to provide an estimated land take if a detention basin is used to attenuate runoff. In accordance with Table G2.1 of Welsh SuDS Standards, the drained impermeable surface area (assumed 85%) should be less than 5 times the vegetated surface area receiving the runoff. This is equivalent to 17% of the total site. • This provides a high land take estimate. Where infiltration rates are greater than 1x10-6m/s, areas up to 25 times the base area of the basin can be assumed to meet interception requirements. • Further reductions in land take can be achieved by adopting a Long-Term Storage approach (SuDS Standards: G2.30), or through design of green roofs, rainwater harvesting systems and infiltration where appropriate. It is noted that contamination could preclude an unlined basin. • Attenuation volumes are presented for the critical storm duration for the 1 in 30-year events with exceedance flows quantified up to the 1 in 100-year event. To prevent development worsening flood risk elsewhere, surface water runoff must be managed on site.					

PE1.10 Antelope Industrial Estate	
Overall Site Assessment	
Development suitability	• **As both parcels of the site are wholly within DAM Zone C2, development may be suitable at this site subject to the justification test being applied. For less vulnerable developments within DAM Zone C2, the justification test (Section 6, TAN 15) needs to be applied with the potential consequences of flooding to the site occurring being accepted.** • **Given the modelled outputs do not reflect DAM Zone 2, it is difficult to advise on developability with full confidence. However, going off Table A1.14 of TAN 15, the development is expected to be designed to be flood free up to the fluvial 1% AEP + climate change event. Figure 8-9 shows that this should be possible for both parcels.** • **Achieving safe access and egress may be a challenge as both main routes are impacted by flooding during the 1% AEP +CC event though depths are mainly shallow (<300mm). The FCA should identify suitable routes.**

9 PE1.12 Rowley's Drive

PE1.12 Rowley's Drive	
Location	Rowley's Drive
Site area (ha)	0.8 (in two separate site parcels)
Watercourse	River Dee (tidal estuary)
NRW Model used	Dee Tidal 2016
Existing use	Open space
Existing site flood risk vulnerability classification (TAN 15)	Not classified - open space
Proposed development flood risk vulnerability classification (TAN 15)	Less vulnerable
Proposed development impermeable area (ha) – *70% based on FCC advice*	0.56

Figure 9-1 Aerial imagery of the site

PE1.12 Rowley's Drive

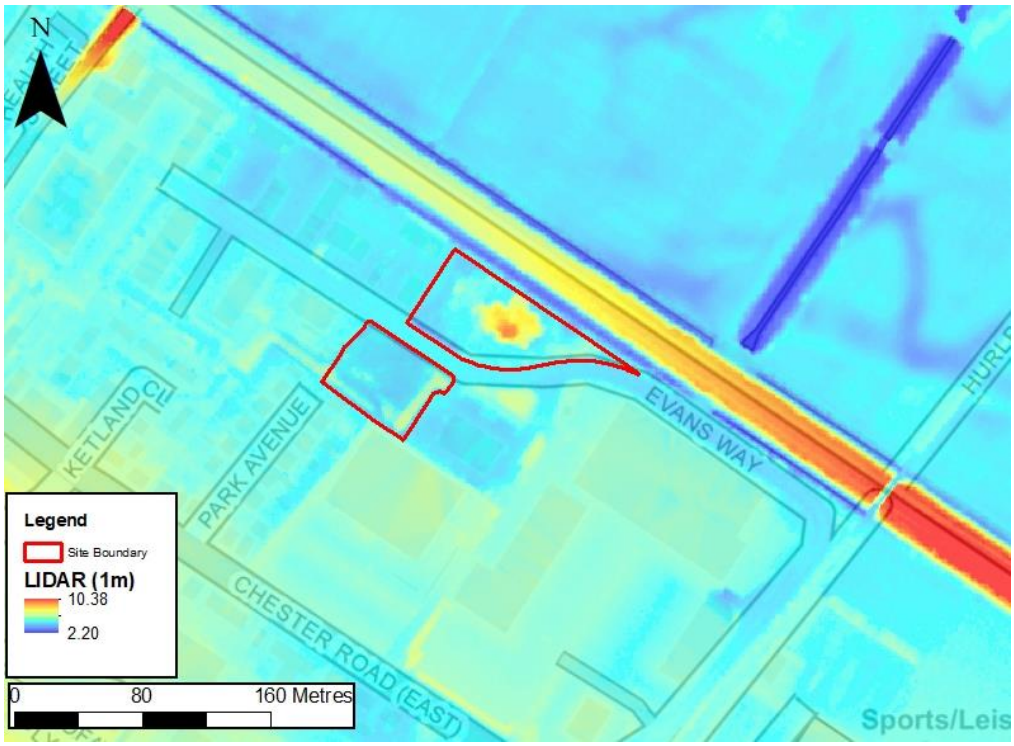


Figure 9-2 Site boundary with 1m LIDAR

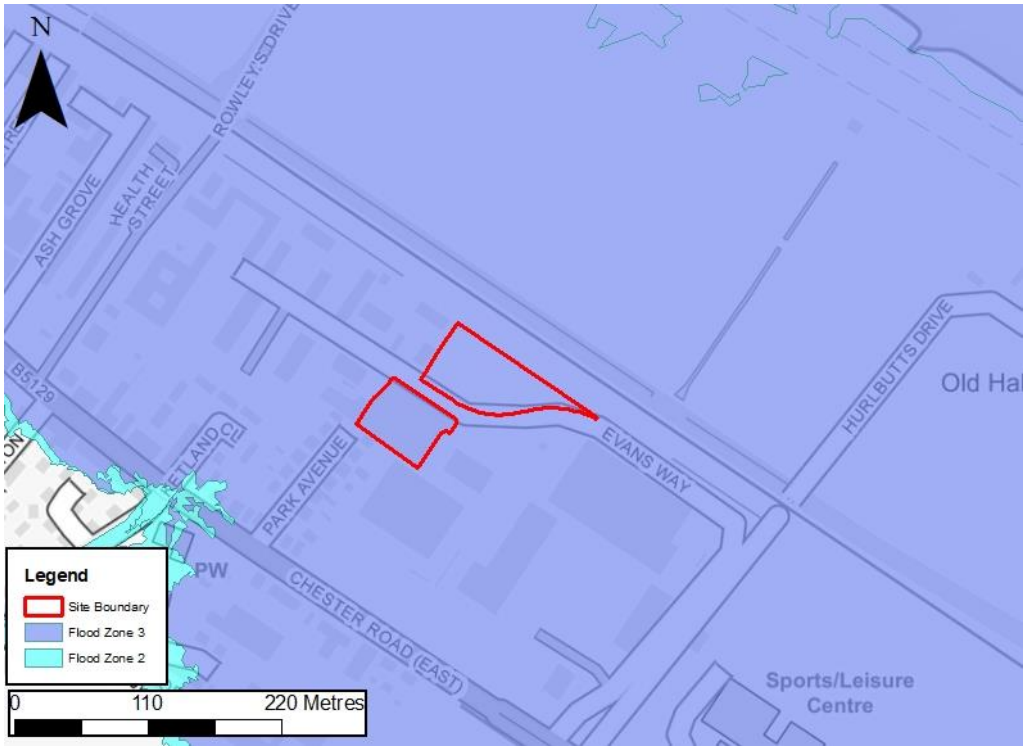


Figure 9-3 Site boundary with NRW Flood Zones 2 and 3

PE1.12 Rowley's Drive

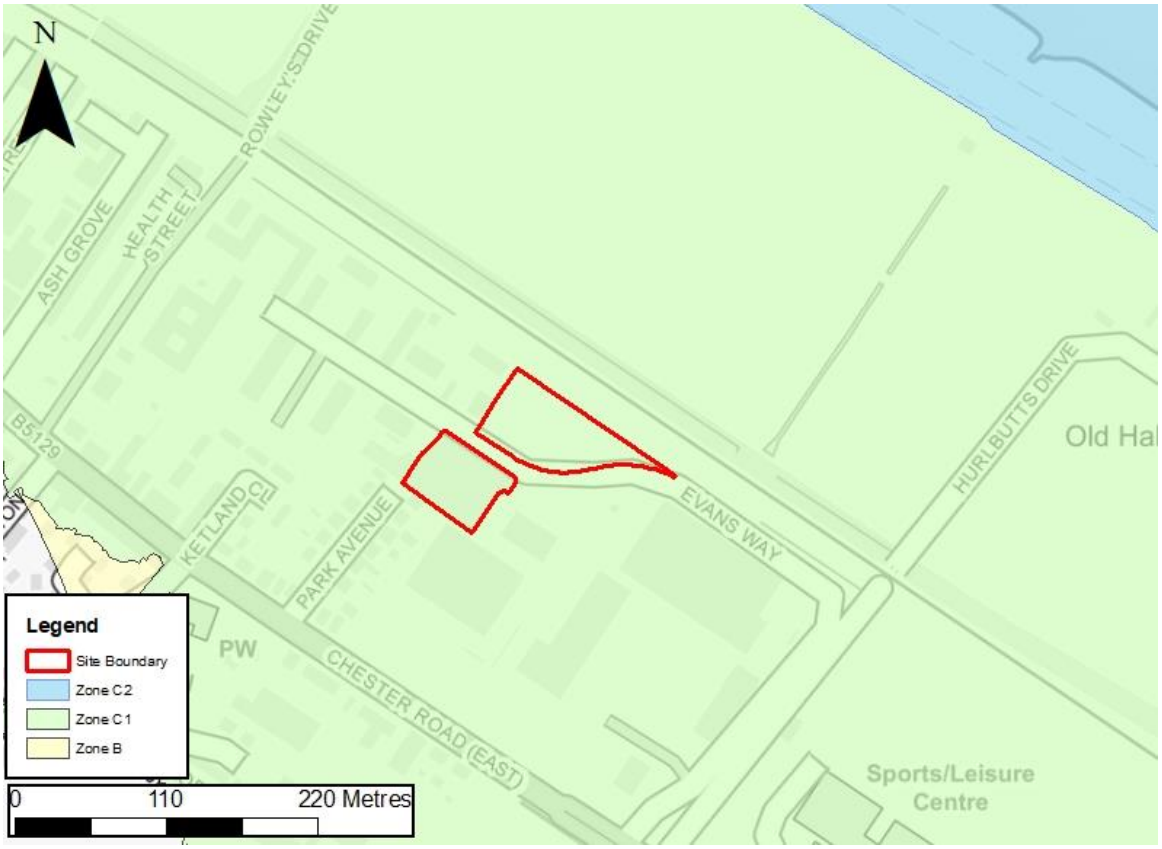


Figure 9-4 Site boundary with DAM mapping

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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earth star Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID. IGN, and the GIS User Community.

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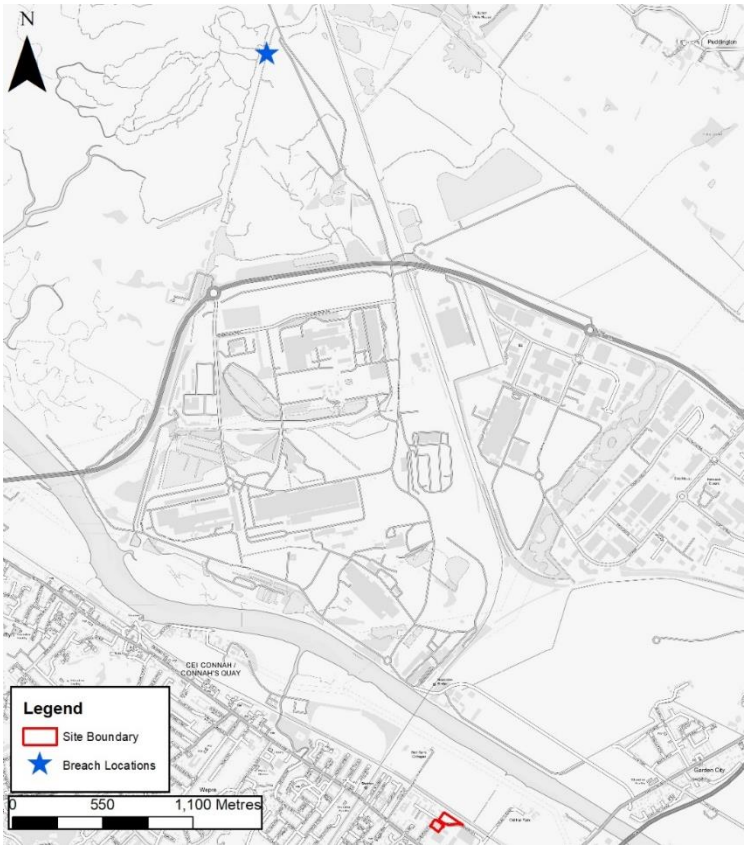
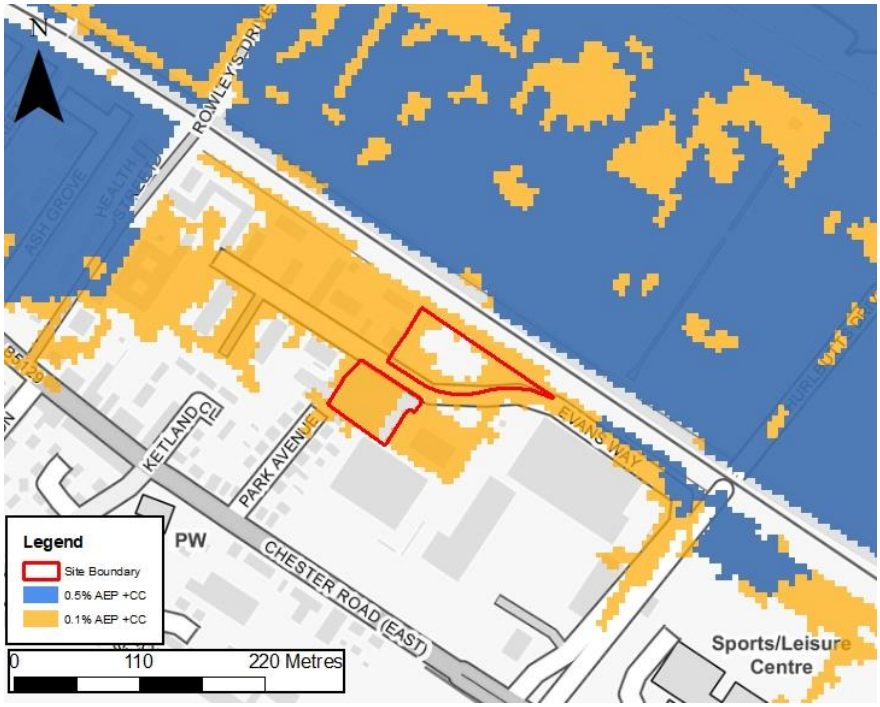
Key findings from the 2020 Flintshire Strategic Flood Consequence Assessment (SFCA)

- This assessment shall refer to the southernmost site parcel as parcel 1 and the northernmost as parcel 2.
- The site is 100% within DAM Zone C1 and Flood Zone 3.
- The risk is tidal from the River Dee.
- There is also significant tidal risk from several of the Dee defence breach scenario models in the 0.5% AEP breach event + climate change with significant flood depths.
- There is potentially significant risk from surface water.
- TAN 15 advice: Plan allocations and applications can only proceed subject to justification in accordance with Section 6 and acceptability of consequences in accordance with Section 7 and Appendix 1.

PE1.12 Rowley's Drive			
Modelled Flood Source: Tidal*			
Flood Zones (%)	Flood Zone 3	Flood Zone 2	Climate Change**
	100	100	n/a
Tidal: average depth (m)	n/a	n/a	n/a
Tidal: maximum depth (m)	n/a	n/a	n/a
Tidal: average hazard	n/a	n/a	n/a
Tidal: maximum hazard	n/a	n/a	n/a
*Based on latest modelling for the River Dee (baseline scenarios), the site is not within baseline flood extents and only from breach scenarios. **Climate change data is based on the critical storm to this site, i.e. 0.5% AEP +CC Queensferry Breach.			
Modelled tidal risk on River Dee	• In both the 0.5% and 0.1% AEP events, both parcels are unaffected by tidal flooding from the River Dee. • Latest modelling of the River Dee was undertaken earlier in 2020 and shows the site to be outside baseline flood extents. As of this report being written, the current Flood Zone and DAM mapping has not been updated to reflect these changes, hence why the above figures show the site to be 100% at risk.		
Modelled tidal risk from breaches on River Dee	**Broken Bank breach scenario** • Breach is located at NGR: SJ3013773338, see Figure 9-5.  **Figure 9-5 Broken Bank breach location in regard to site boundary** • Tidal risk, modelled from the Broken Bank breach scenario, was shown to impact the site during the 0.1% AEP +CC breach event. Modelled tidal risk is shown to be high as seen in Figure 9-5, with extents covering most of the south-western		

PE1.12 Rowley's Drive	
	parcel (parcel 1), and the areas alongside the site boundaries in the north-eastern parcel (parcel 2). • There is tidal risk during both the 0.1% AEP +CC and the 0.5% AEP +CC breach events along the main access/egress route. Access/egress would need to be shown to be achievable in regard the outlines from breach scenarios.  **Figure 9-5 Modelled Broken Bank breach flood extents for the 0.5% AEP +CC and 0.1% AEP +CC events** • Modelled depths within the site boundary are illustrated in Figure 9-6. Depths are between 0.01-0.66m in parcel 1, 0.01-0.63m in parcel 2 with the highest depths recorded along the northern site boundaries closest to the River Dee. • Depths along the main access/egress route, Evans Way, increase to 0.7m in the 0.1% AEP +CC breach event.

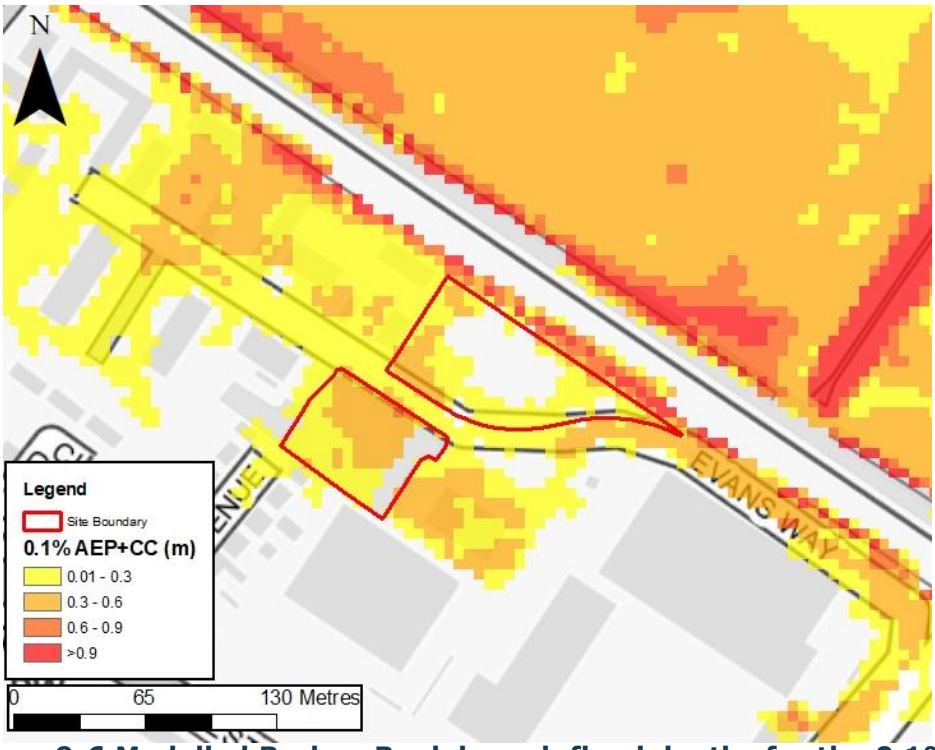


Figure 9-6 Modelled Broken Bank breach flood depths for the 0.1% AEP +CC event

Bumpers Lane breach scenario

Figure 9-7 Bumpers Lane breach location in regard to site boundary

- Breach is located at NGR: SJ3765065440, see Figure 9-7.
- Tidal risk, modelled from the Bumpers Lane breach scenario, impacts the site

during the 0.1% AEP +CC breach event. Modelled tidal risk is shown to be high as seen in Figure 9-8, with extents covering most of the parcel 1, and the areas alongside the site boundaries in the parcel 2.

- Again, there is tidal risk during both the 0.1% AEP +CC and the 0.5% AEP +CC breach events along the main access/egress route.

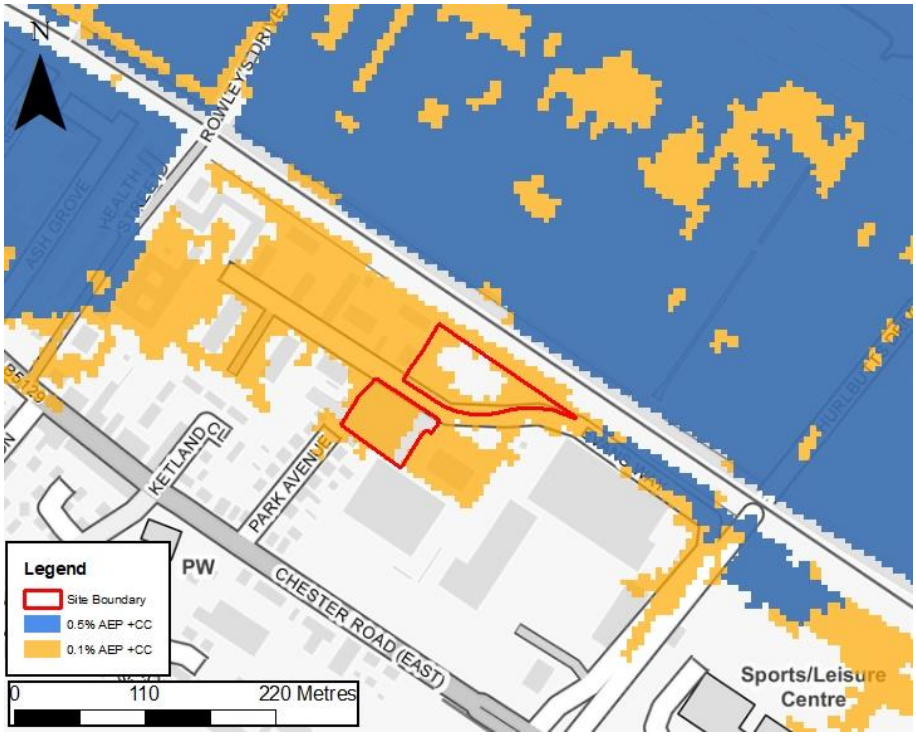


Figure 9-8 Modelled Bumpers Lane breach flood extents for the 0.5% AEP +CC and 0.1% AEP +CC events

- Modelled depths gain access/egress route are as high as 0.7m in the 0.1% AEP +CC breach event, Figure 9-9

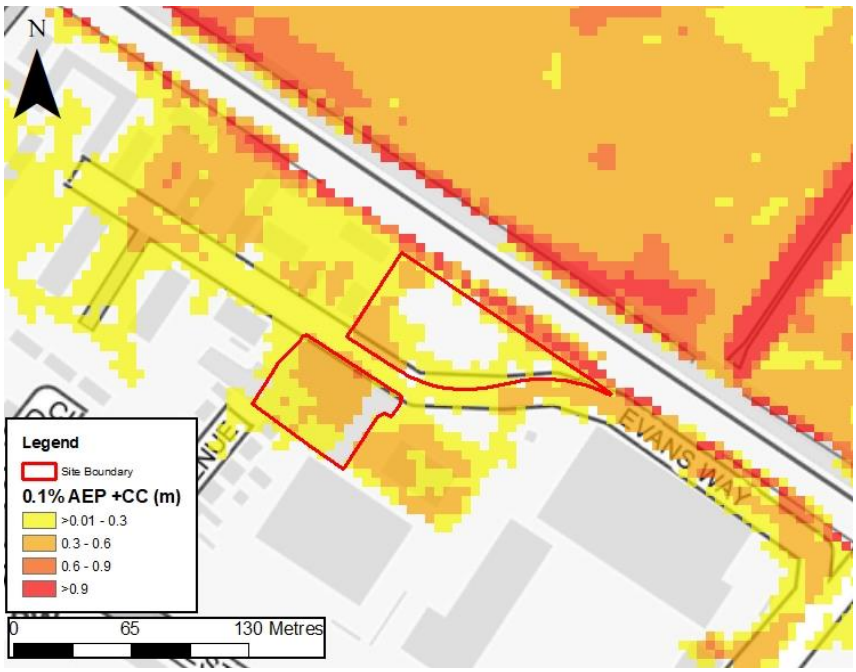


Figure 9-9 Modelled Bumpers Lane breach flood depths for the 0.1% AEP +CC event

Mold Junction breach scenario

- Breach is located at NGR: SJ3732365467, see Figure 9-10.

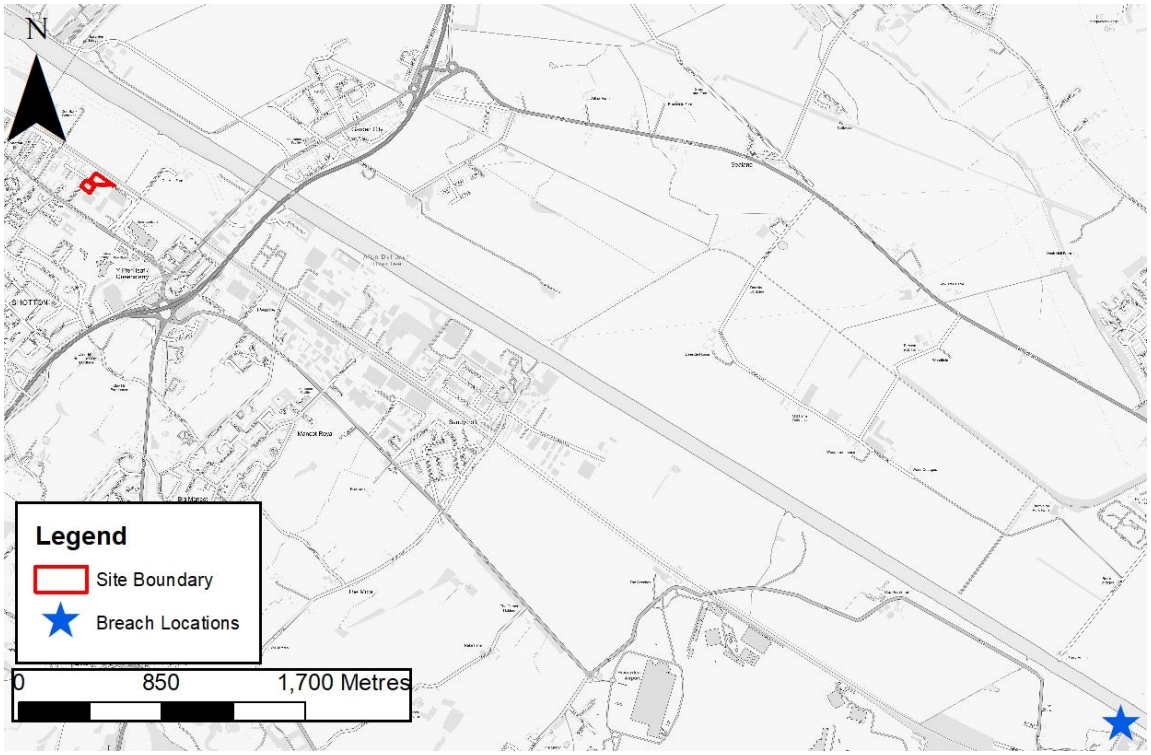


Figure 9-10 Mold Junction breach location in regard to site boundary

- Tidal risk, modelled from the Mold Junction breach scenario, impacts the site during the 0.1% AEP +CC breach event. Similarly to the previous breach scenarios, modelled tidal risk is shown to be high, with extents covering most of the parcel 1, and the areas alongside the site boundaries in the parcel 2 (Figure 9-11).

PE1.12 Rowley's Drive	
	• Again, there is tidal risk during both the 0.1% AEP +CC and the 0.5% AEP +CC breach events along the main access/egress route

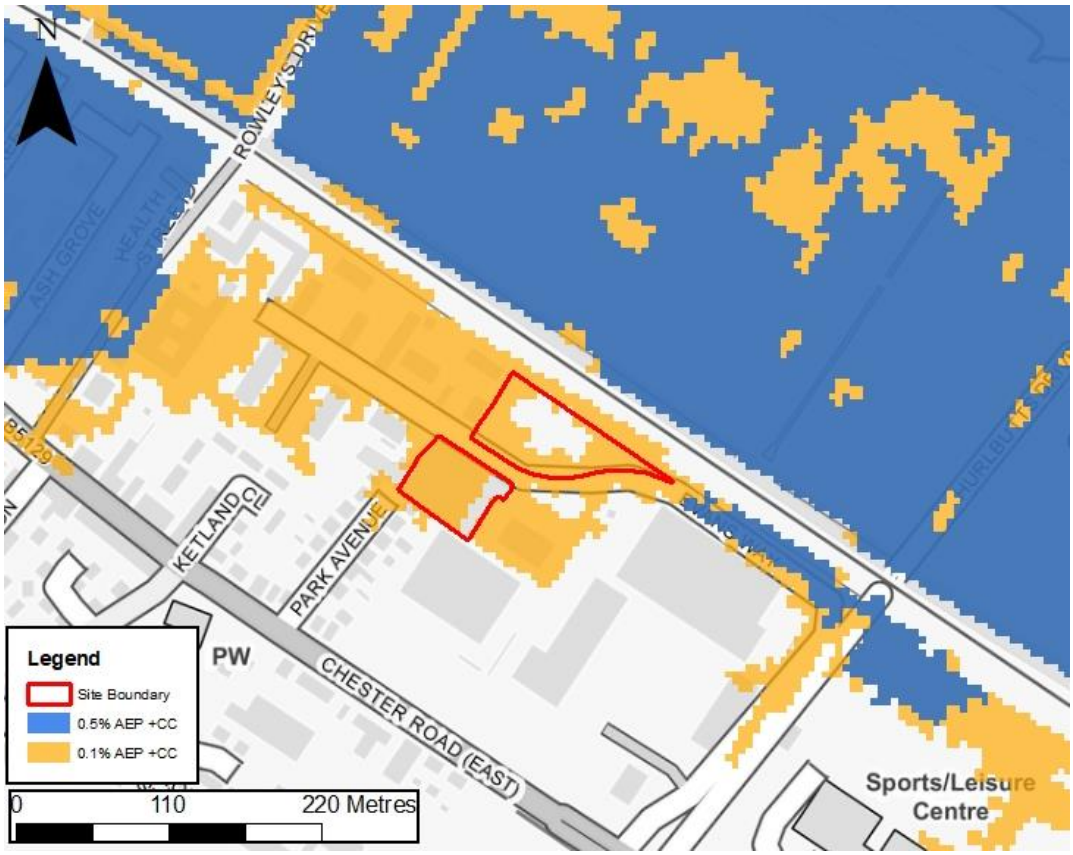


Figure 9-11 Modelled Mold Junction breach flood extents for the 0.5% AEP +CC and 0.1% AEP +CC events

- Modelled depths within the site boundary following a breach at Mold Junction are illustrated in figure 9-12. Depths are between 0.02-0.68m in parcel 1, and 0.05-0.65m in parcel 2 with the highest depths recorded along the northern site boundaries closest to the River Dee.
- Again, depths along the main access/egress route are considerable. Modelled depths are as high as 0.6m in the 0.1% AEP +CC breach event.

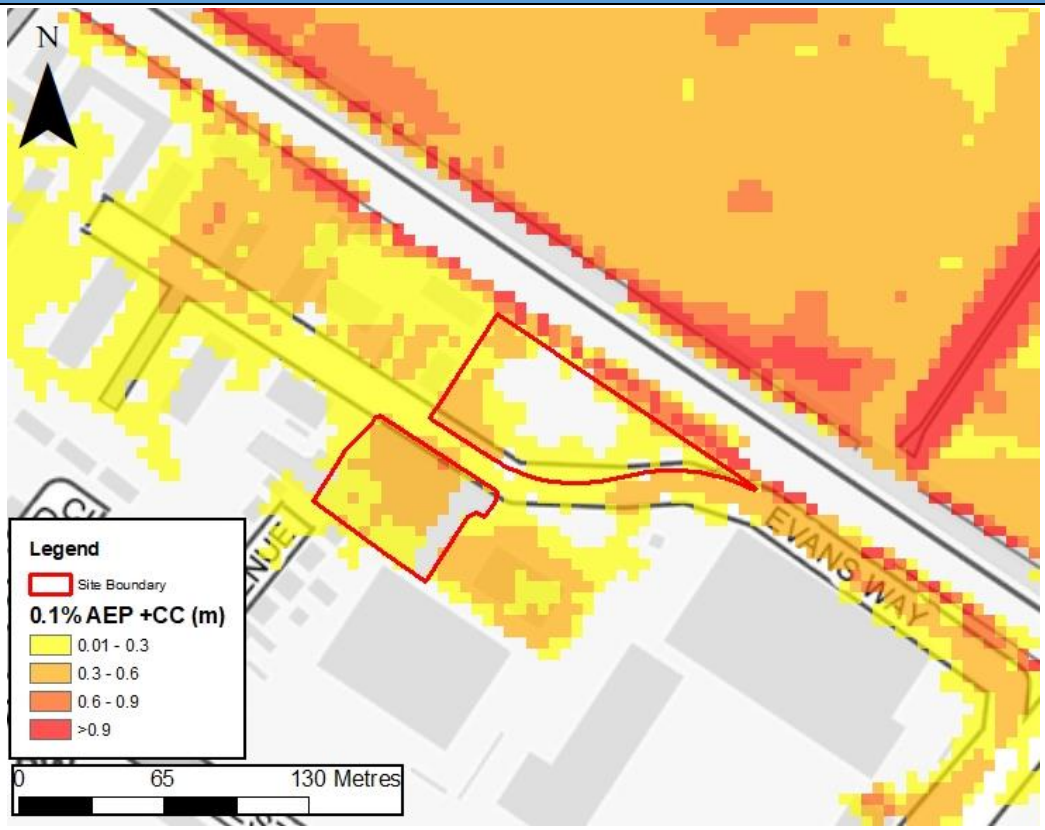


Figure 9-12 Modelled Mold Junction breach flood depths for the 0.1% AEP +CC event

Pentre breach scenario

- Breach is located at NGR: SJ3265568314, see Figure 9-13.

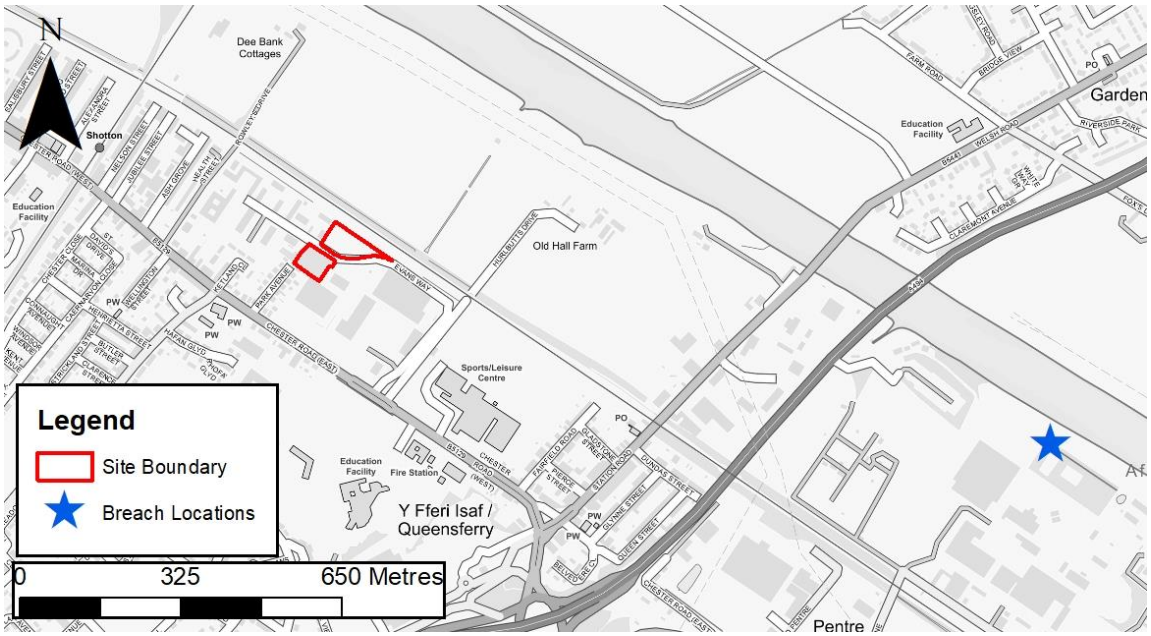
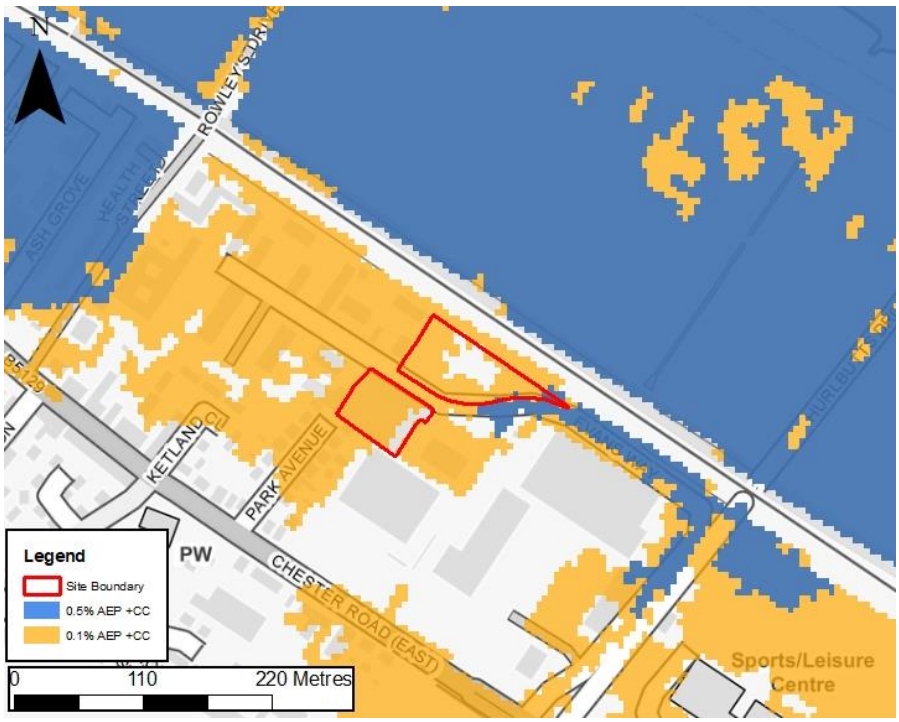


Figure 9-13 Pentre breach location in regard to site boundary

- Tidal risk, modelled from the Pentre breach scenario, impacts the site during the 0.1% AEP +CC and 0.5% AEP +CC breach events.

PE1.12 Rowley's Drive	
	• Similarly to the previous breach scenarios, parcel 1 is only affected by a 0.1% AEP +CC breach event, with considerable tidal risk across most of the site, with only the eastern boundary left unaffected by tidal flooding (Figure 9-14). • For parcel 2, modelled tidal risk is shown to be high, with extents inundating the areas along the site boundary during the 0.1% AEP +CC breach event, leaving the centre of the site with no tidal flood risk from a breach. During the 0.5% AEP +CC breach event, the southern boundary of the parcel is impacted by flooding.  **Figure 9-14 Modelled Pentre breach flood extents for the 0.5% AEP +CC and 0.1% AEP +CC events** • Modelled depths within the site boundary following the Pentre breach scenario during the 0.1% AEP +CC breach event are illustrated in Figure 9-15. Depths are between 0.05-0.69m in parcel 1, and 0.06-0.65m in parcel 2 with the highest depths recorded towards the centre of parcel 1 and western boundary of parcel 2. • During the 0.5% AEP +CC breach event, depths along the southern boundary of parcel 2 are as high as 0.19m. • Again, depths along the main access/egress route are considerable. Modelled depths are up to 0.6m in the 0.1% AEP +CC and 0.5m in the 0.5% AEP +CC breach events.

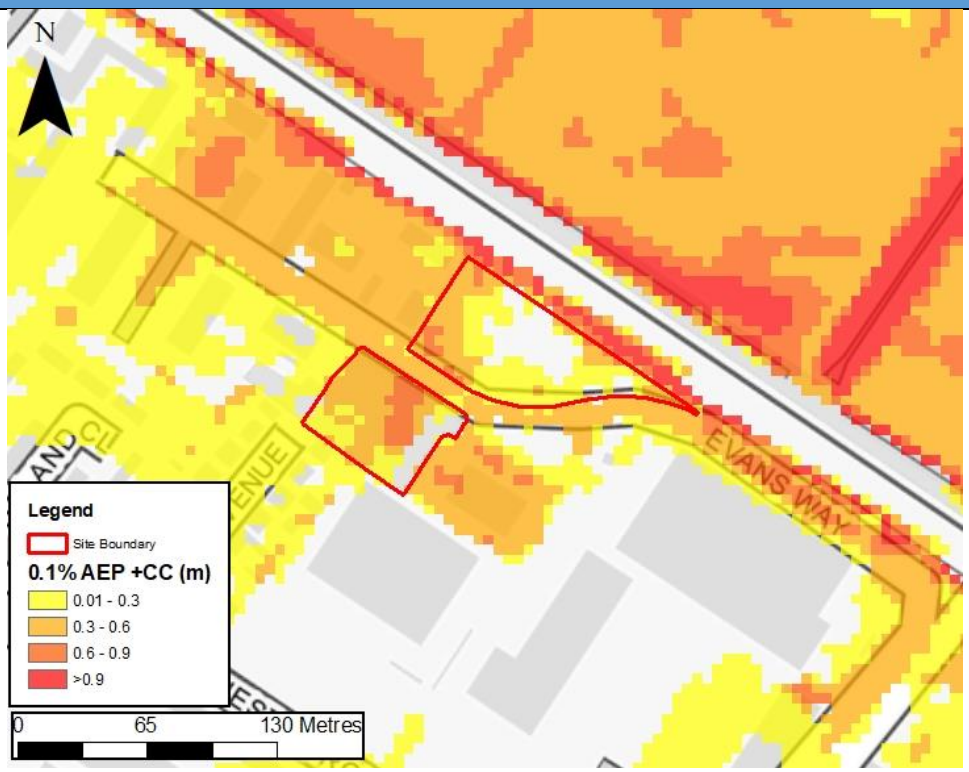


Figure 9-15 Modelled Pentre breach flood depths for the 0.1% AEP +CC event

Queensferry breach scenario

- Breach is located at NGR: SJ3208068601, see Figure 9-16.

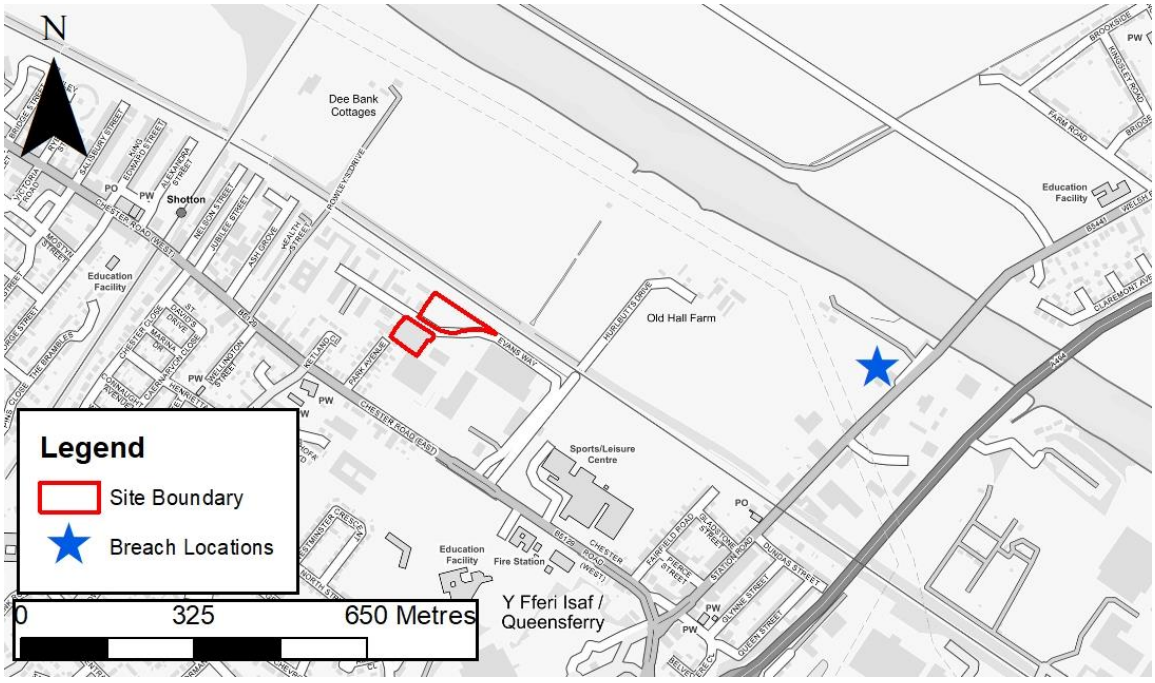


Figure 9-16 Queensferry breach location in regard to site boundary

- Tidal risk, modelled from the Queensferry breach scenario, considerably impacts the site during the 0.1% AEP +CC and 0.5% AEP +CC breach events.
- The entirety of parcel 1 is inundated by a 0.1% AEP +CC breach event. During

PE1.12 Rowley's Drive	
	the 0.5% AEP +CC breach event, only the southern corner of the parcel is unaffected by the modelled breach (Figure 9-17). • For parcel 2, modelled tidal risk is shown to be high, with extents inundating the areas along the site boundary during the 0.1% AEP +CC and 0.5% AEP +CC breach events, leaving the centre of the site with no tidal flood risk from a breach.

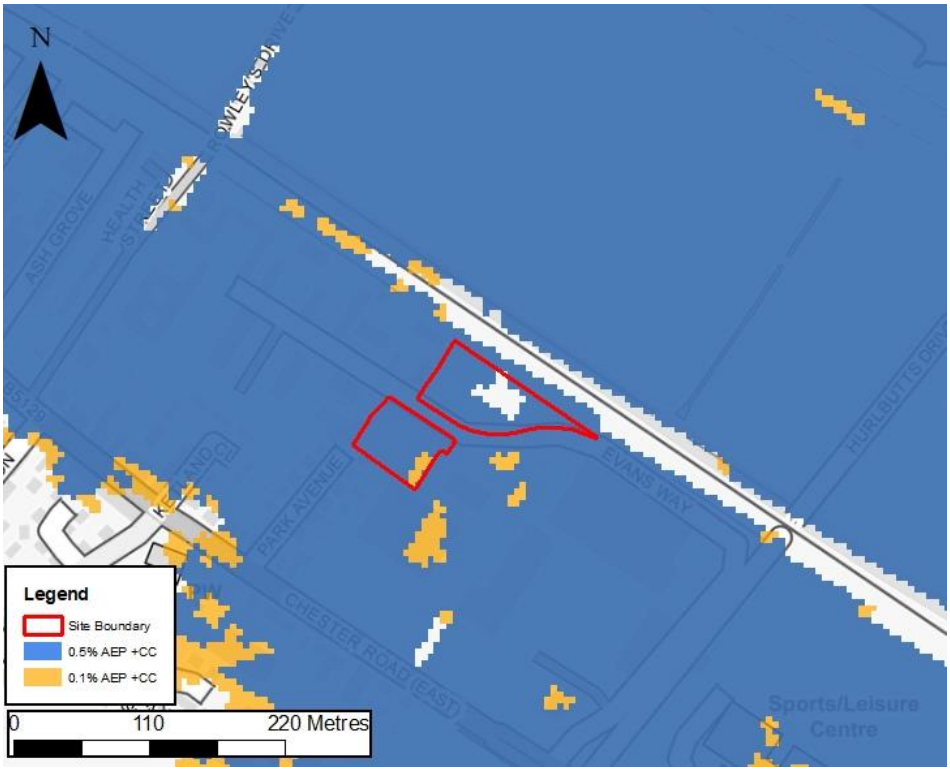


Figure 9-17 Modelled Queensferry breach flood extents for the 0.5% AEP +CC and 0.1% AEP +CC events

- Modelled depths within the site boundary following the Queensferry breach scenario during the 0.1% AEP +CC breach event are shown in Figure 9-18. Depths are between 0.23-1.45m in parcel 1, and 0.13-1.43m in parcel 2 with the highest depths recorded along the northern site boundaries closest to the River Dee.
- During the 0.5% AEP +CC breach event, depths are between 0.18-1.3m in parcel 1, and 0.1-1.27m within parcel 2 (Figure 9-19).
- The main access/egress route to the site it completely inundated during both events. Depths during the 0.1% AEP +CC breach event are as high as 1.5m, and up to 1.3m for the 0.5% AEP +CC breach event. Access/egress would need to be shown to be achievable during breach scenarios.

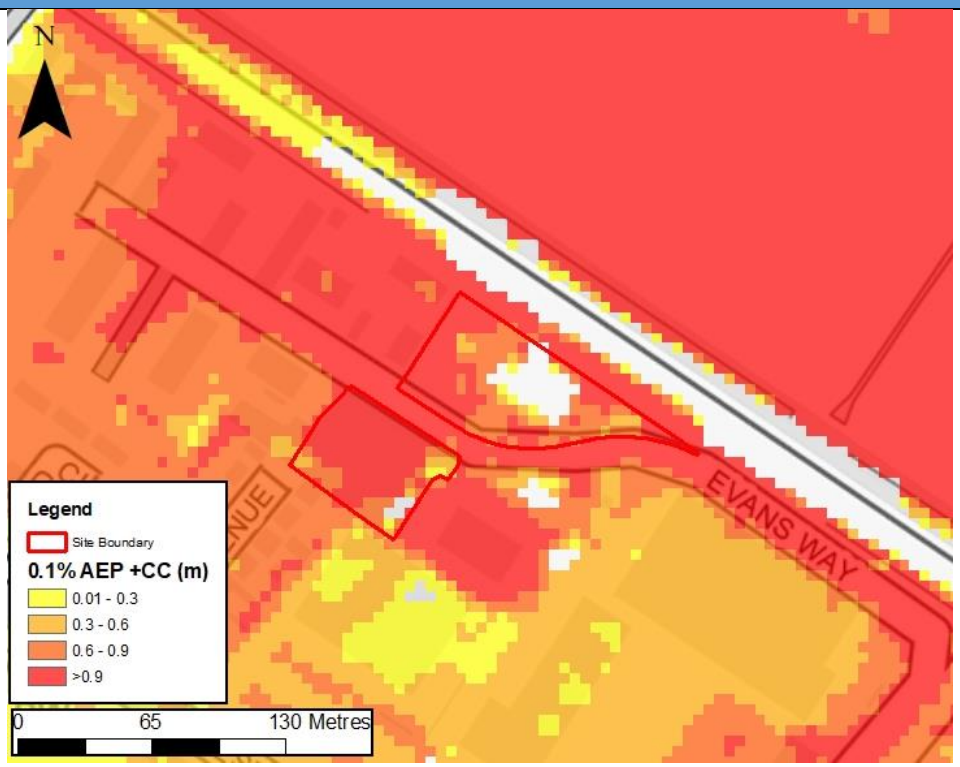


Figure 9-18 Modelled Queensferry breach flood depths for the 0.1% AEP +CC event

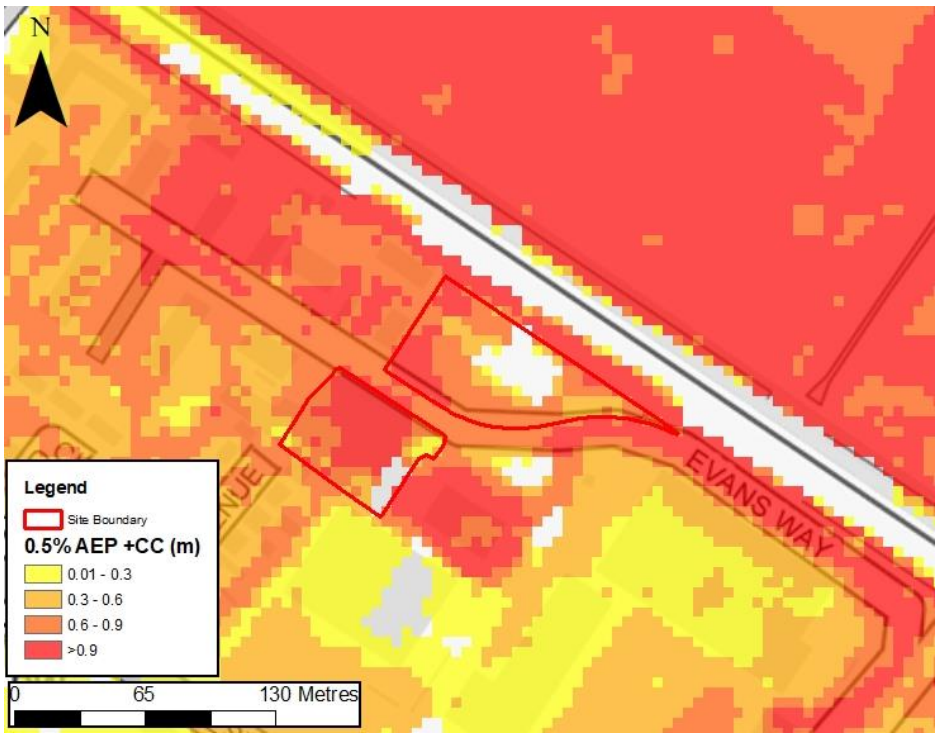


Figure 9-19 Modelled Queensferry breach flood depths for the 0.5% AEP +CC event

Beeches breach scenario

- Breach is located Breach is located at NGR: SJ3528565712, see Figure 9-20.

PE1.12 Rowley's Drive

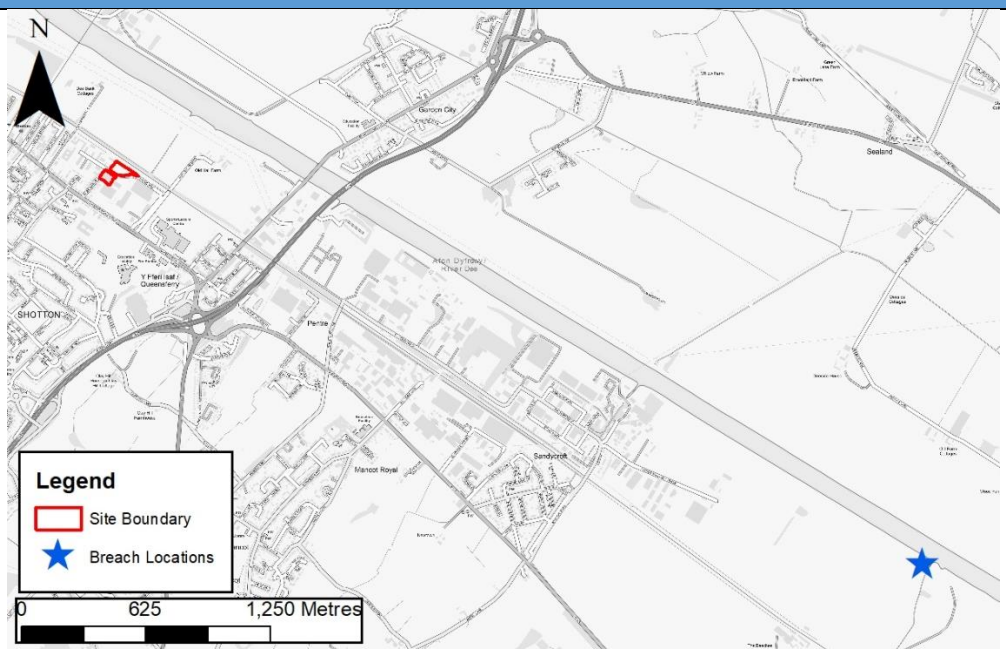


Figure 9-20 Beeches breach location in regard to site boundary

- During the 0.1% AEP +CC breach event at Beeches, both site parcels are inundated by flooding as well as surrounding access roads on Evans Way. Whilst flood extents during the 0.5% AEP +CC event do not impact the site, flooding from this event does inundate large areas of land around the site boundary.

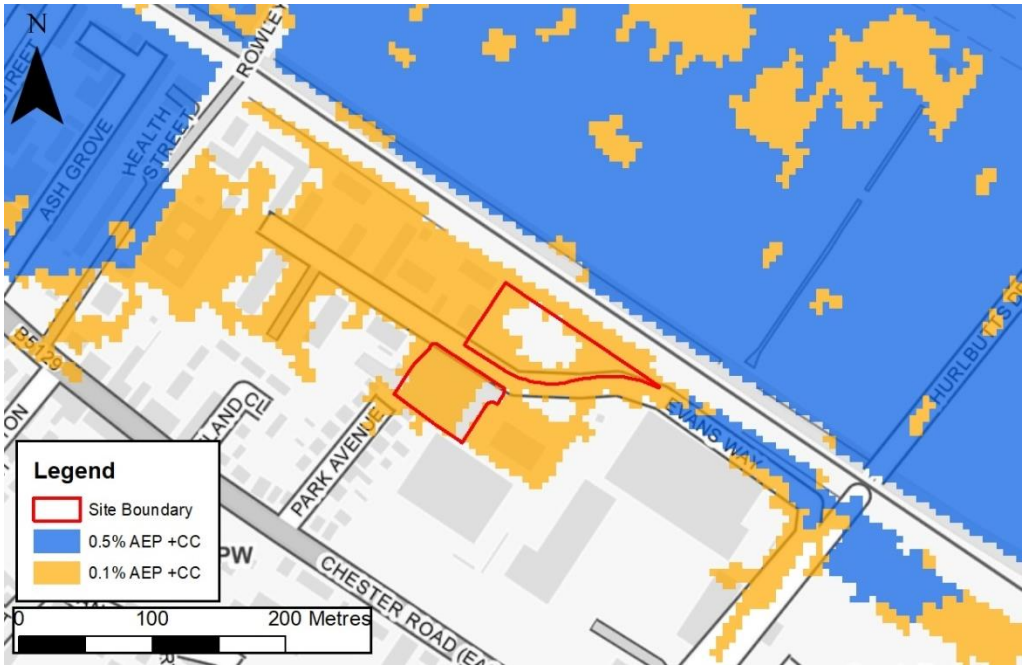
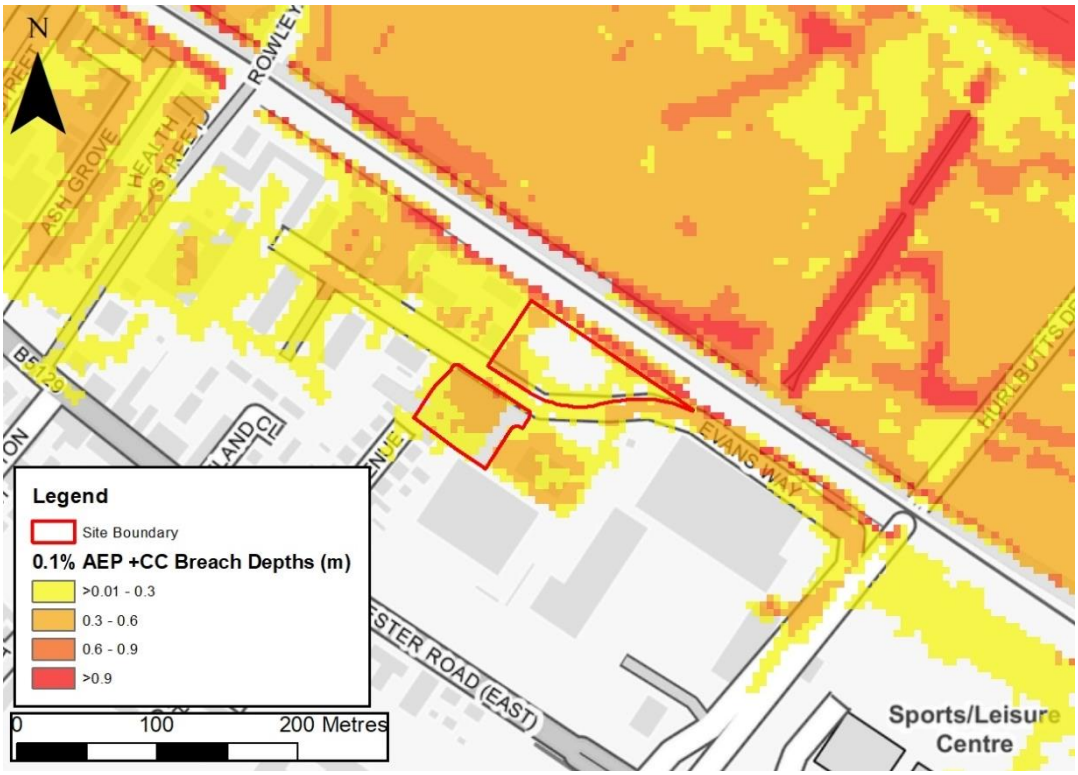


Figure 9-21 Modelled Beeches breach flood extents for the 0.5% AEP +CC and 0.1% AEP +CC events

PE1.12 Rowley's Drive	
	 **Figure 9-22 Modelled Beeches breach flood depths for the 0.1% AEP +CC event** • Flood depths during the 0.1% AEP +CC breach event are on average 0.26m with maximum modelled depths of 0.67m.
Historic flooding	• The site is not within the Historic Flood Map outlines.
Defences	• Based on NRW's Spatial Flood Defences dataset, there are several flood embankments north east of the site along a railway line. The embankments closest to the site both have a condition rating of 'poor'. Both embankments have a standard of protection of 200 years. Other embankments within the vicinity of the site have condition ratings of 'fair'. The site is 100% within DAM Zone C1 so the Dee defence embankments act as flood protection for the site.
Flood Alert/Warning Area	• The site lies within one flood alert area and one flood warning area. The alert being described as 'areas along the North Wales coast from the Dee estuary to the east coast of Anglesey' and the warning as 'the area alongside the Hawarden Embankment of the River Dee including Queensferry, Sandycroft, Saltney and Connah's Quay'.
Observations, mitigation options & site suitability: fluvial	• **Both land parcels are at significant risk of tidal flooding during a number of Dee defence breach scenarios with considerable flood depths and hazards.** • **Given the risk identified, this site should not be developed and should be left as open space.**
Flood Source: Groundwater	
Flood risk: groundwater	• As the development site is located near to the Dee Estuary, it is assumed that all groundwater will follow natural topography and flow north east.

PE1.12 Rowley's Drive
Flood Source: Surface Water
Surface Water Flood Risk to Proposed Development Site

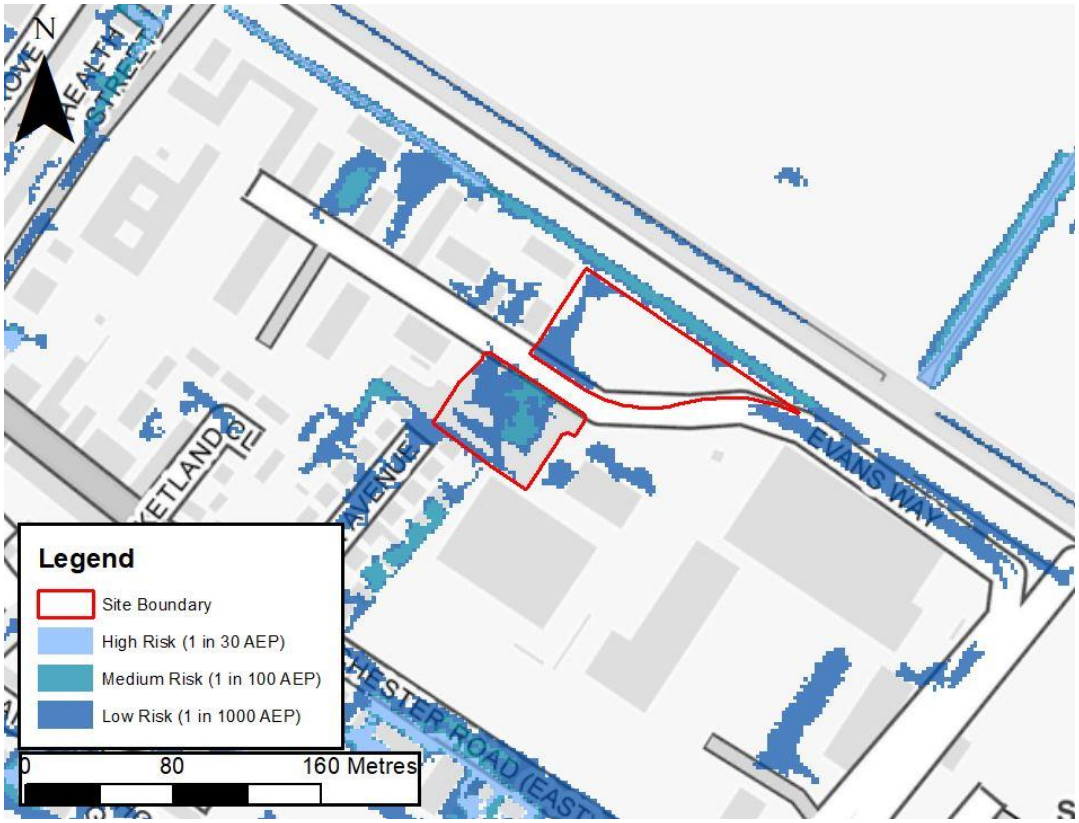


Figure 9-21 Surface water risk to site PE1.12 (NRW Risk of Flooding from Surface Water map)

Existing development: Risk of Flooding from Surface Water map (%)	High Risk (1 in 30 AEP)	Medium risk (1 in 100 AEP)	Low risk (1 in 1000 AEP)
	0.0	5.3	32.8
Surface water flooding depths	Max: n/a	Max: 0.4	Max: 0.9
Surface water hazards	Max: n/a Mean: n/a	Max: Low Mean: Moderate	Max: Moderate Mean: Significant
Surface water flood risk to development site	• Surface water risk is considerable within parcel 1 during the low and medium risk events, with extents covering a large proportion of the site. Parcel 2 is likely only to be at risk of surface water flooding along the western boundary during the low risk event.		
Climate change	• The current day 0.1% surface water outline provides an indication of the likely increase in extent of more frequent events. Figure 9-17 indicates there to be a high risk of surface water flooding to the majority parcel 1 of the site, however flooding is concentrated along the western boundary of parcel 2.		
Mitigation options & site suitability: surface water	• **The national Risk of Flooding from Surface Water is not suitable for providing site-specific advice. The FCA should therefore investigate surface water risk further through an outline drainage strategy.**		

PE1.12 Rowley's Drive						
	• **Parcel 1 should not be developed given the surface water risk.**					
Surface Water Flood Risk from Proposed Development						
Proposed development limiting runoff rate in accordance with G2.30 of Welsh SuDS Standards: (l/sec) Qbar: 2* l/s (FEH Statistical) *Note that a minimum flow rate of 5l/s may be applied only where there is a risk of throttle outlets being blocked and it can be demonstrated that no alternative practical SuDS arrangement could be used that would reduce this blockage risk.						
Design flood event (incl climate change)	Critical storm duration Hrs	Inflow volume m^3	Outflow volume m^3	Attenuation required m^3	Time to empty (assuming no infiltration) Hrs	Total detention basin storage required: Area (ha) of unlined base and depth (m)
30yr Rainfall+20%	12	497	60	436	86.3	0.14 ha 0.31 m
30yr Rainfall+40%	12	579	60	519	102.7	0.14 ha 0.37 m
100yr Rainfall+20%	12**	651	60	590 (154m3 of exceedance storage)	116.8	0.14 ha 0.42 m
100yr Rainfall+40%	12**	759	60	699 (180m3 of exceedance storage)	138.2	0.14 ha 0.50 m
Climate change	• Application of the central (20%) and upper band (40%) potential change anticipated for climate change in the table above shows the estimated attenuation volumes for the 1% AEP and 3.33% AEP rainfall events.					
Surface water: flood risk impacts from development site, mitigation & SuDS	• As part of this appraisal we have included calculations to provide an estimated land take if a detention basin is used to attenuate runoff. In accordance with Table G2.1 of Welsh SuDS Standards, the drained impermeable surface area (assumed 85%) should be less than 5 times the vegetated surface area receiving the runoff. This is equivalent to 17% of the total site. • This provides a high land take estimate. Where infiltration rates are greater than 1x10-6m/s, areas up to 25 times the base area of the basin can be assumed to meet interception requirements. • Further reductions in land take can be achieved by adopting a Long-Term Storage approach (SuDS Standards: G2.30), or through design of green roofs, rainwater harvesting systems and infiltration where appropriate. It is noted that contamination could preclude an unlined basin. • Attenuation volumes are presented for the critical storm duration for the 1 in 30-year events with exceedance flows quantified up to the 1 in 100-year event. To prevent development worsening flood risk elsewhere, surface water runoff must be managed on site.					
Overall Site Assessment						
Development suitability	• **Tidal risk during the present day 0.5% AEP and 0.1% AEP breach events does not affect the site from any of the modelled breach scenarios, the site is impacted during the CC events.** • **There is significant tidal risk from the River Dee defence breach scenario modelling particularly during the 0.1% AEP +CC breach event but also**					

PE1.12 Rowley's Drive	
	during the 0.5% AEP +CC breach events from all of the breach locations. It is therefore unlikely that this site could be allocated.

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Doncaster
Dublin
Edinburgh
Exeter
Glasgow
Haywards Heath
Isle of Man
Limerick
Newcastle upon Tyne
Newport
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Registered Office
1 Broughton Park
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Broughton
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North Yorkshire
BD23 3FD
United Kingdom

+44(0)1756 799919
info@jbaconsulting.com
www.jbaconsulting.com
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Appendix 4

NRW Site Specific Comments on Remaining PE1 Employment Allocations of Concern

Site	Comments
PE1.1 Manor Lane, Chester Aerospace Park	The site lies within Zone C1 as defined by the Development Advice Map. The NRW Flood Risk Map confirms that the site lies entirely within the 0.1% (1 in 1,000) Annual Exceedance Probability (AEP) event flood outline. A section of the site (the north-eastern portion) benefits from planning permission for employment development (planning reference 059221). The SFCA has considered blockage of Broughton Brook, indicating that the site would be at flood risk in the 1% AEP blockage event + cc (Table 7.11). Maximum flood depths would be in the region of 0.3 m (average is 0.2 m). We advise that further work is needed to show that the consequences of flooding at the site are capable of being managed in an acceptable way and to consider the impact on flood risk elsewhere. The additional information should be provided in an updated SFCA.
PE1.2 Manor Lane, Hawarden Park Extension	The site lies partially within Zone C2 as defined by the Development Advice Map, and within the 1% (1 in 100) and 0.1% (1 in 1,000) AEP event flood outlines The SFCA has considered blockage of Broughton Brook, indicating that the site would be at flood risk in the 1% AEP blockage event + cc (Table 7.11). Maximum depths would be in the region of 1.4 m (average is 0.7 m). We advise that selective siting of development may be required to avoid areas at highest risk. Further work is needed to show that the consequences of flooding at the site are capable of being managed in an acceptable way and to consider the impact on flood risk elsewhere.
PE1.4 Greenfield Business Park II	The site lies within Zone C1 as defined by the Development Advice Map, and within the 0.5% (1 in 200) and 0.1% (1 in 1,000) AEP event flood outlines.

	There is no assessment of the flood risk posed to this site in the SFCA (except for identifying the flood zone designation). Further work is needed to show that the consequences of flooding at the site are capable of being managed in an acceptable way and to consider the impact on flood risk elsewhere.
PE1.5 Greenfield Business Park III	The site lies within Zone C1 as defined by the Development Advice Map, and within the 0.5% (1 in 200) AEP event flood outline. There is no assessment of the flood risk posed to this site in the SFCA (except for identifying the flood zone designation). Further work is needed to show that the consequences of flooding at the site are capable of being managed in an acceptable way and to consider the impact on flood risk elsewhere.
PE1.6 Broncoed Industrial Estate	The site lies partially within Zone C2 as defined by the Development Advice Map, and within the 0.1% (1 in 1,000) AEP event flood outline. There is no assessment of the flood risk posed to this site in the SFCA (except for identifying the flood zone designation). Further work is needed to show that the consequences of flooding at the site are capable of being managed in an acceptable way and to consider the impact on flood risk elsewhere.
PE1.8 Adjacent Mostyn Docks	The site lies partially within Zone C2 as defined by the Development Advice Map, and within the 0.5% (1 in 200) and 0.1% (1 in 1,000) AEP event flood outlines. There is no assessment of the flood risk posed to this site in the SFCA (except for identifying the flood zone designation. Further work is needed to show that the consequences of flooding at the site are capable of being managed in an acceptable way and to consider the impact on flood risk elsewhere.
PE1.10 Antelope Industrial Estate	The site lies within Zone C2 as defined by the Development Advice Map, and within the 0.1% (1 in 1,000) AEP event flood outline. There is no assessment of the flood risk posed to this site in the SFCA (except for identifying the flood zone designation). Further work is needed to show that the consequences of flooding at the site are capable of being managed in an acceptable way and to consider the impact on flood risk elsewhere.

PE1.12 Rowley's Drive	The site lies within Zone C1 as defined by the Development Advice Map, and within the 0.5% (1 in 200) AEP event flood outline The SFCA has considered the River Dee breach outputs, and shows that the site is at significant risk in the 0.5% AEP breach event plus climate change. Maximum depths are in the region of 1.3 m (average is 0.8 m) Further work is needed to show that the consequences of flooding at the site are capable of being managed in an acceptable way and to consider the impact on flood risk elsewhere. The further works needed for the above allocations will enable interested parties to understand if the proposals are likely to be acceptable in terms of being in accordance with section 7 and appendix 1 of TAN15

Appendix 5

Weetwood

Development • Planning • Environment

RIVERSIDE, QUEENSFERRY

FLOOD CONSEQUENCES ASSESSMENT

Final Report v1.1

November 2020

Weetwood Services Ltd
Park House
Broncoed Business Park
Ffordd Byrnwr Gwair
Mold
CH7 1FQ

01352 700045
info@weetwood.net www.weetwood.net

Report Title	**Riverside, Queensferry** Flood Consequences Assessment Final Report v1.1
Client	Flintshire County Council
Date of issue	26 November 2020

Prepared by	Owen Astbury BSc (Hons) GradCIWEM Graduate Project Manager
Checked and approved by	Adam Edgerley BSc (Hons) Technical Director

This document has been prepared solely as a Flood Consequences Assessment for Flintshire County Council This report is confidential to Flintshire County Council and Weetwood Services Ltd accepts no responsibility or liability for any use that is made of this document other than by Flintshire County Council for the purposes for which it was originally commissioned and prepared.

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1 INTRODUCTION

1.1 PURPOSE OF REPORT

Weetwood Services Ltd ('Weetwood') has been instructed by Flintshire County Council (FCC) to prepare a Flood Consequences Assessment (FCA) report in association with a proposed redevelopment and extension of the existing Gypsy and Traveller site at Riverside, Queensferry.

It is proposed that the extension be allocated in the forthcoming Local Development Plan and this FCA has been produced to support that process.

The assessment has been undertaken in accordance with the requirements of Technical Advice Note 15 (TAN15).

1.2 STRUCTURE OF THE REPORT

The report is structured as follows:

Section 1	Introduction and report structure
Section 2	Presents national and local flood risk and drainage planning policy
Section 3	Provides background information relating to the development site, the development proposals, ground conditions and existing site access arrangements
Section 4	Assesses the potential sources of flooding to the development site
Section 5	Presents flood risk mitigation measures based on the findings of the assessment
Section 6	Addresses the effect of the proposed development on surface water runoff and presents an illustrative surface water drainage scheme to ensure that surface water runoff is sustainably managed and flood risk is not increased elsewhere.
Section 7	Presents a summary of key findings
Section 8	Presents the recommendations

2 PLANNING POLICY AND GUIDANCE

2.1.1 Technical Advice Note 15

The general approach of TAN15 is to set out a precautionary framework to guide planning decisions in areas at high risk of flooding. The overarching aim of the framework is, in order of preference, to:

- Direct new development away from those areas which are at a high risk of flooding.
- Where development has to be considered in high risk areas (i.e. Zone C) only those development which can be justified should be located in such areas.

2.1.1.1 Justification Test

In accordance with Paragraph 6 of TAN15 for the Justification Test to be passed it must be demonstrated that:

i. Its location in Zone C is necessary to assist, or be part of, a local authority regeneration initiative or a local authority strategy required to sustain an existing settlement; **or**,
ii. Its location in Zone C is necessary to contribute to key employment objectives supported by the local authority, and other key partners, to sustain an existing settlement or region;

and,

iii. It concurs with the aims of Planning Policy Wales (PPW) and meets the definition of previously developed land (PPW Fig 2.1); and,
iv. The potential consequences of a flooding event for the particular type of development have been considered, and in terms of the criteria contained in sections 5 and 7 and appendix 1 found to be acceptable.

2.1.1.2 Surface Water Drainage

TAN15 provides an overview of the requirements for the management of surface water to ensure that development does not increase flood risk at the site or elsewhere.

Paragraph 8.3 of TAN15 states that *"the aim should be for new development not to create additional run-off when compared with the undeveloped situation, and for redevelopment to reduce runoff where possible. It is accepted that there may be practical difficulties in achieving this aim"*.

2.1.2 Welsh Government

2.1.2.1 Climate Change Allowances for Planning, August 2016

A consultation letter[1] and supporting guidance note[2] issued by Welsh Government in August 2016 sets out allowances for climate change for use in FCAs submitted in support of planning applications.

When considering new development proposals, TAN15 states that it is necessary to take account of the potential impact of climate change over the lifetime of development. The Welsh Government guidance note states that *"residential development is assumed to have a lifetime of 100 years while a lifetime of 75 years is assumed for non-residential developments. To ensure future development can provide a safe and secure living and /or working environment throughout its lifetime, national planning policy requires proposals in areas of*

[1] Welsh Government consultation letter 23 August, 2016 (Ref: CL-03-16)

[2] https://gov.wales/docs/desh/publications/160831guidance-for-flood-consequence-assessments-climate-change-allowances-en.pdf

high flood risk to be accompanied by an assessment of flooding consequences to and from the development, taking into account the impacts of climate change".

The climate change allowances detailed within the Welsh Government guidance note are informed by latest available information on climate change projections and allowances are provided for different epochs (periods) of time over the next century.

The guidance note should be applied to planning applications (full, outline and reserved matters) submitted from 1 December 2016.

2.1.2.2 Statutory Standards for Sustainable Drainage Systems

From 7 January 2019, the Flood and Water Management Act 2010 (Schedule 3) requires new developments to include Sustainable Drainage Systems (SuDS) features that comply with national standards.

New developments of more than one dwelling or where the area covered by construction work equals or exceeds 100 m^2 require approval before construction can commence from the SuDS Approval Body (SAB) to ensure compliance with the SuDS standards.

The SAB will also require to adopt the SuDS unless the scheme serves only a single property or is a publically maintained road to which Section 41 of the Highways Act 1980 applies.

The statutory standards are as follows:

Standard S1; Surface water runoff destination

- Priority Level 1: Surface water runoff is collected for use;
- Priority Level 2: Surface water runoff is infiltrated to ground;
- Priority Level 3: Surface water is discharged to a surface water body;
- Priority Level 4: Surface Water is discharged to surface water sewer, highway drain, or another drainage system;
- Priority Level 5: Surface water runoff is discharged to a combined sewer.

Standard S2; Surface water runoff hydraulic control

1. Surface water should be managed to prevent, so far as possible, any discharge from the site for the majority of rainfall events of less than 5 mm.
2. The surface water runoff rate for the 1:1 annual probability event (or agreed equivalent) should be controlled to help mitigate the negative impacts of the development runoff on the morphology and associated ecology of the receiving surface water bodies.
3. The surface water runoff (rate and volume) for the 1:100 annual probability event (or agreed equivalent) should be controlled to help mitigate negative impacts of the development on flood risk in the receiving water body.
4. The surface water runoff for events up to the 1:100 annual probability (or agreed equivalent) should be managed to protect people and property on and adjacent to the site from flooding from the drainage system.
5. The risks (both on site and off site) associated with the surface water runoff for events greater than the 1:100 annual probability should be considered. Where the consequences are excessive in terms of social disruption, damage or risk to life, mitigating proposals should be developed to reduce these impacts.
6. Drainage design proposals should be examined for the likelihood and consequences of any potential failure scenarios (e.g. structural failure or blockage), and the associated flood risks managed where possible.

Standard S3; Surface water quality management

Treatment for surface water runoff should be provided to prevent negative impacts on the receiving water quality and/or protect downstream drainage systems, including sewers.

Standard S4; Amenity

The design of surface water management systems should maximise amenity benefits.

Standard S5; Biodiversity

The design of the surface water management system should maximise biodiversity benefits.

Standard S6; Design of drainage or construction, operation and maintenance

1. All elements of the surface water drainage system should be designed so that they can be constructed easily, safely, cost-effective, in a timely manner, and with the aim of minimising the use of scare resources and embedded carbon (energy).
2. All elements of the surface water drainage system should be designed to ensure maintain and operation can be undertaken (by the relevant responsible body) easily, safely, cost-effective, in a timely manner, and with the aim of minimising the use of scare resources and embedded carbon (energy).
3. The surface water drainage system should be designed to ensure structural integrity of all elements under anticipated loading conditions over the design life of the development site, taking into account the requirement for reasonable levels of maintenance.

2.2 LOCAL PLANNING POLICY AND GUIDANCE

Flintshire County Council's (FCC) Unitary Development Plan (UDP) is the adopted development plan for the 15 year period running from 2000 to 2015. Although the adopted UDP expired at the end of 2015, it remains the adopted development plan for the county.

FCC is currently in the process of preparing a LDP for the county, which will focus on delivering sustainable development within the county for the period 2015 to 2030.

2.2.1 FCC UDP, Adopted September 2011

The following policies are relevant in respect of flood risk:

Policy EWP 17; Flood Risk

Development which would seek to reduce the impact and frequency of flood risk to areas at risk of flooding will be generally supported provided:

- the design and character of the works is appropriate to the locality;
- the works do not adversely impact on interests of acknowledged nature conservation and recreation importance; and
- the works do not increase flood risk elsewhere

Other development within areas at risk of flooding will only be permitted where the Council considers that the development is justified and is satisfied that:

- the consequences of a flooding event can be effectively managed
- it would not increase the risk of flooding elsewhere
- appropriate alleviation or mitigation measures have been incorporated into the proposal and will be available for the lifetime of the development; and
- it would not have any adverse effects on the integrity of tidal and fluvial flood defences

2.2.2 Flintshire LDP Deposit Plan, September 2019

A draft version of the LDP is available on the FCC website, dated September 2019.

The following policies are relevant in respect of flood risk:

Policy EN14; Flood Risk

In order to avoid the risk of flooding, development will not be permitted:

A. in areas at risk of fluvial, pluvial, coastal and reservoir flooding, unless it can be demonstrated that the development can be justified in line with national guidance and is supported by a technical assessment that verifies that the new development is designed to alleviate the threat and consequences of flooding;
B. where it would lead to an increase in the risk of flooding on the site or elsewhere from fluvial, pluvial, coastal or increased surface water run-off from the site;
C. where it would have a detrimental effect on the integrity of existing flood risk management assets: or
D. where it would impede access to existing and proposed flood risk management assets for maintenance and emergency purposes.

Policy EN15; Water Resources

Development affecting water resources will only be permitted if:

A. it would not have a significant adverse impact on the capacity and flow of groundwater, surface water, or coastal water systems;
B. it would not pose an unacceptable risk to the quality of groundwater, surface water, or coastal water; and
C. it would have access to adequate water supply, sewerage and sewage treatment facilities which either already exist, or will be provided in time to serve the development, without detriment to existing abstractions, water quality, fisheries, amenity or nature conservation.

2.3 CONSENTS

An Environmental Permit for Flood Risk Activities may be required from the Natural Resources Wales (NRW) for work:

- In, under, over or near a main river (including where the river is in a culvert)
- On or near a flood defence on a main river
- In the flood plain of a main river
- On or near a sea defence

Further information can be found at https://naturalresources.wales/apply-for-a-permit/flood-risk-activities/flood-risk-activity-permits-information/?lang=en.

If the location of an activity is on any watercourse that lies within an Internal Drainage District (IDD) an application will need to be made to NRW for a Flood Risk Activity Permit.

Ordinary Watercourse Consent may be required from the lead local flood authority for work to an ordinary watercourse. Undertaking activities controlled by local Byelaws (made under the Water Resources Act 1991) also requires the relevant consent.

2.4 RELEVANT DOCUMENTS

The FCA has been informed by the following documents:

- River Dee Catchment Flood Management Plan (CFMP), NRW, January 2010
- Preliminary Flood Risk Assessment (PFRA), FCC, June 2011

3 SITE DETAILS AND PROPOSED DEVELOPMENT

3.1 SITE LOCATION

The approximately 3.08 ha site is located off the A494 at Ordnance Survey National Grid Reference SJ 324 683, as shown in **Figure 1**.

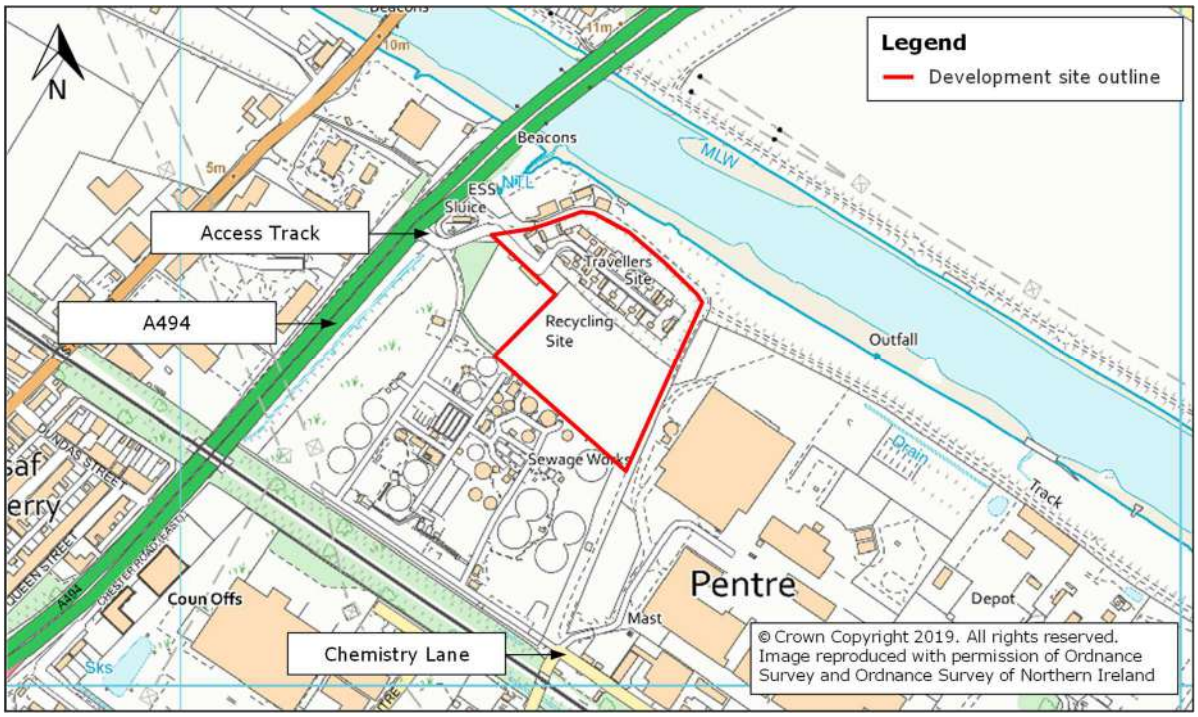


Figure 1: Site Location

3.2 EXISTING AND PROPOSED DEVELOPMENT

The site is currently comprises an existing gypsy and traveller site, including static caravans and chalets, and an area of unmanaged brownfield land that has no current use.

Development proposals are to extend the current gypsy and traveller area located in the north-east of the site into the area of brownfield land in the south. This will include caravans and utility buildings with areas of hardstanding, along with the closure of the existing site access from the A494. It is understood that the existing access route from the A494 is considered sub-standard and a new access into the site via Chemistry Lane will be required for the existing site and the proposed extension (**Appendix A**).

TAN15 classifies residential development as 'highly vulnerable' land use[3].

3.3 WATERBODIES IN THE VICINITY OF THE SITE

The locations of the waterbodies within the site's vicinity are identified in **Figure 2**.

The River Dee flows in a north-westerly direction approximately 30 metres (m) north-east of the site. The River Dee is tidally dominated in this location.

[3] TAN15, Figure 2

Queensferry Drain is located approximately 40 m west of the site and flows in a north-easterly direction where it outfalls into the River Dee.

Drain A is located approximately 190 m east of the site and flows in a south-easterly direction.

Drain B and Drain C are located approximately 200 and 230 m south of the site respectively and both flow in in a south-easterly direction.

The River Dee and Queensferry Drain are classified as 'main rivers'.

Drains A, B and C are classified as 'ordinary watercourses'.

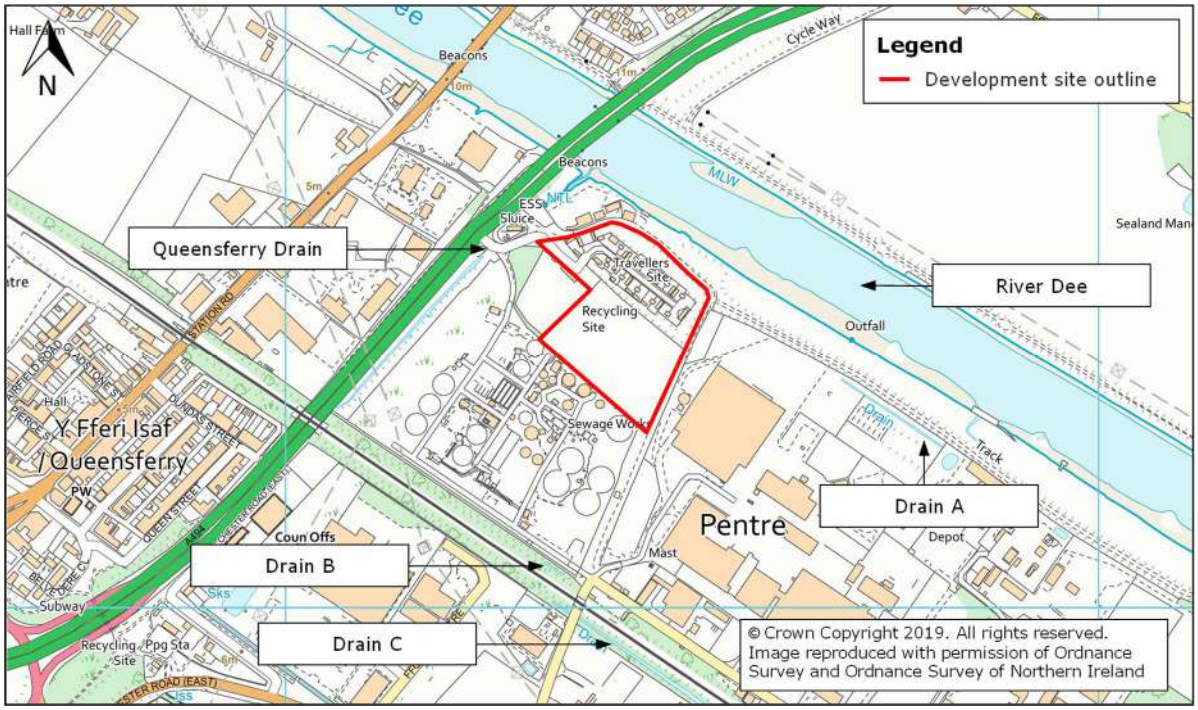


Figure 2: Location of Waterbodies

3.4 GROUND CONDITIONS

National Soils Research Institute mapping[4] classifies soil conditions at the site and within the surrounding area as 'loamy and clayey soils of coastal flats with naturally high groundwater'.

According to the British Geological Survey (BGS) the bedrock geology underlying the site is likely to be 'Etruria Formation – Mudstone, Sandstone and Conglomerate' whilst superficial deposits are 'Tidal Flat Deposits – Clay, Silt and Sand'.

BGS borehole records[5] located approximately 80.0 m west of the site, indicate strata comprising of 'soil and clay' between 0.0 and 1.5 m below ground level (bgl), which is subsequently underlain by 'sand and clay' between 1.5 and 17.3 m bgl.

[4] www.landis.org.uk/soilscapes/

[5] www.bgs.ac.uk/data/boreholescans/home.html, Ref: SJ36NW45/24

3.5 SITE LEVELS

A topographic survey of the site has been undertaken by PM Surveys UK Ltd and is provided in **Appendix B**.

Ground levels within the site boundary are generally shown to be in the region of 6.50 to 7.80 metres Above Ordnance Datum (m AOD).

3.6 ACCESS AND EGRESS

Access and egress to the site is currently provided via an access track that connects directly with the A494 to the west of the site.

The topographic survey undertaken for the site does not extend as far as the access track or A494. LiDAR data has therefore been utilised.

Ground levels along the existing access track are shown to be in the region 6.24 to 8.15 m AOD.

It is understood that post-development, vehicular access and egress to the site will be provided via a new access road that connects with Chemistry Lane to the south-east of the site (see **Appendix A**).

Ground levels along Chemistry Lane are subsequently shown to be in the region 4.43 to 8.71 m AOD.

4 REVIEW OF FLOOD RISK

4.1 FLOOD ZONE DESIGNATION

Flood zones refer to the probability of river and sea flooding. TAN15 defines flood zones as follows:

- Zone A: Considered to be at little or no risk of fluvial or tidal/coastal flooding.
- Zone B: Areas know to have been flooded in the past evidenced by sedimentary deposits.
- Zone C: Based on [the Natural Resources Wales] flood outline, equal to or greater than 0.1% (river, tidal or coastal). Zone C is subdivided into the following two zones:
    - Zone C1: Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.
    - Zone C2: Areas of the floodplain without significant flood defence infrastructure.

The flood zones are shown on the Development Advice Map. The zones do not account for possible future changes in flooding due to the impact of climate change or the presence of flood defences (although areas benefitting from flood defences may be indicated).

According to the Development Advice Map (**Figure 3**) the site is located in Zone C1.

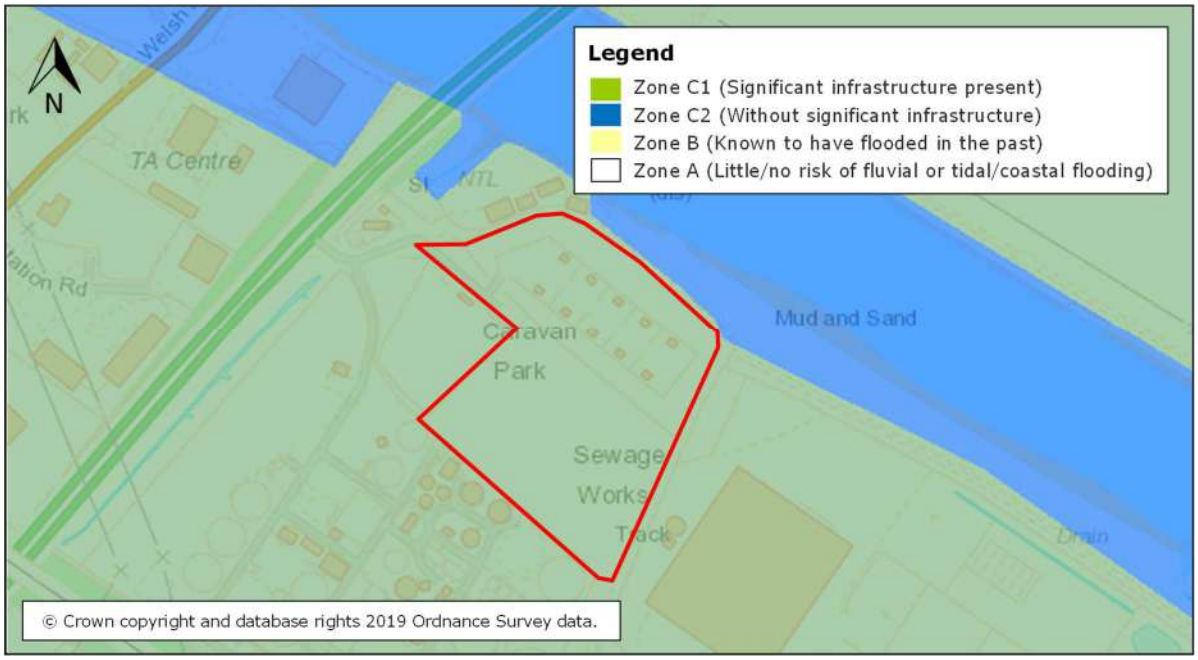


Figure 3: Development Advice Map
(Source: NRW website)

The Flood Risk Map (Rivers and Sea) (**Figure 4**) indicates that the site is located in the defended 1:100 fluvial / 1:200 tidal flood outline, thereby supporting the sites Zone C1 designation.

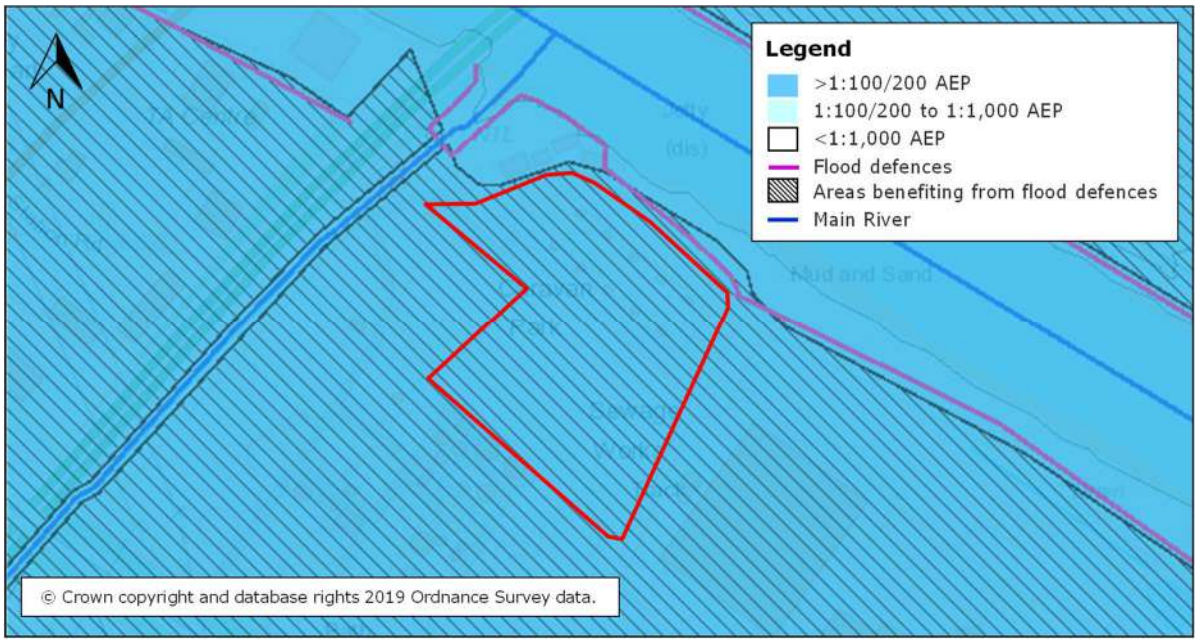


Figure 4: Flood Risk Map (Rivers and Sea)
(Source: NRW website)

4.2 JUSTIFICATION TEST

As the site is classified as being in Zone C1, any new development should only be permitted if the Justification Test is passed (see **Section 2.1.1.1**).

It is considered that the redevelopment of the site will help sustain the existing settlement; meeting point (i) of the Justification Test. Point (iii) of the Justification Test is met as the site can be regarded as 'previously developed land'.

This report aims to address point (iv) of the Justification Test.

4.3 HISTORICAL RECORDS OF FLOODING

According to NRW historic flood outlines database[6], there are no records of the site previously being affected by flooding.

4.4 TIDAL FLOOD RISK – RIVER DEE

As discussed in **Section 3.3**, the River Dee is located approximately 30 m to the north-east of the site. The River Dee is tidally dominated in this location and benefits from existing flood defence infrastructure.

4.4.1 Modelled Flood Levels and Extents

Overtopping and breach of the existing River Dee flood defences has been assessed by Weetwood using the NRW River Dee model. The hydrology of the model was updated to account for 100 years of climate change up to the year 2120 using the Environment Agency 'Coastal Flood Boundaries Update 2018' tidal levels, which has been applied to the 1:200 and 1:1,000 annual probability events.

[6] http://lle.gov.wales/catalogue/item/HistoricFl/?lang=en

4.4.1.1 Overtopping

The modelled outputs (**Appendix C**) indicate that the existing site is generally expected to remain dry during overtopping conditions. However, during a 1:1,000 (2120) annual probability event, a small amount of flooding along the western boundary may occur that is in the region of 30 mm.

In addition, the proposed access route to the south is shown to remain dry.

4.4.1.2 Breach

Weetwood has reviewed the NRW *Tidal Dee Breach Simulations; Model File Note* dated 27 January 2017 and four of the breach locations are within the general vicinity of the site, which are as follows (including OSNGR of the breach):

1. Shotton (331346, 369026)
2. Queensferry (332077, 368603)
3. Pentre (332676, 368307)
4. Sandycroft (334462, 367198)

Based on the existing modelled outputs that are available from NRW, the worst-case scenario breach for the site is expected to be from a breach occurring in the vicinity of Shotton.

The Shotton breach scenario has therefore been remodelled using the updated tidal levels for the year 2120 for both the 1:200 and 1:1,000 annual probability events.

The breach parameters have been modified in order to be more realistic; the 50 m wide breach has been modelled to initiate at the peak of the first of three tidal cycles, which is considered to be most appropriate for assessing flood risk to the site in this instance.

The baseline modelled outputs are provided in **Appendix D**. During both assessed breach annual probability events, the majority of the site is expected to remain dry with some flooding in the south-western part of the site. **Table 1** summarises the modelled maximum level, depth and velocity of floodwaters expected at the site.

Please note that the modelled information below represents flood risk in the existing scenario before any mitigation is applied to the site; therefore these figures should not be utilised to determine compliance with A1.14 or A1.15 of TAN15.

Table 2 summarises the maximum depth and velocity of floodwaters expected along the proposed access route via Chemistry Lane and Mancot Lane during the aforementioned breach flood events.

Table 1: Site Flood Information – Shotton Breach (Baseline)

Annual Probability Event	Max Level (m AOD)	Max Depth (m)		Max Velocity (m/s)	
		Highest	Ave.	Highest	Ave.
1:200 +CC	6.89	0.23	0.09	0.63	0.08
1:1,000 +CC	7.01	0.36	0.13	0.81	0.09

Table 2: Access Flood Information – Shotton Breach (Baseline)

Annual Probability Event	Max Depth (m)		Max Velocity (m/s)	
	Highest	Ave.	Highest	Ave.
1:200 +CC	1.57	0.73	1.22	0.51
1:1,000 +CC	1.68	0.87	1.25	0.53

4.5 FLUVIAL FLOOD RISK

4.5.1 Queensferry Drain

As discussed in **Section 3.3**, Queensferry Drain is located approximately 40 m west of the site.

Queensferry Drain was modelled as part of the Halcrow *Broughton Brook Viability Study*[7]. The outputs from this study indicate that the site is located outside the 1:1,000 annual probability flood outline and is therefore not considered to be at risk of flooding from this source.

4.5.2 Land Drains

As outlined in **Section 3.3**, Drain A, B and C are located to the east and south of the site.

The network of drains within the locality act as conveyance routes for surface water before ultimately outfalling into the River Dee. No detailed modelling of Drain A, B and C has been undertaken; however, in the absence of such information the NRW Risk of Flooding from Surface Water map (**Figure 5**) has been used as a reasonable proxy. This indicates that there is no anticipated flood risk from Drain A, B or C in up to a 1:1,000 annual probability event.

4.6 FLOOD RISK FROM SURFACE WATER

The Surface Water Flood Risk map (**Figure 5**) indicates that the majority of the site is at a 'very low' risk of surface water flooding. However, there is a small area on site towards the northern boundary that is shown to be at 'low' risk of surface water flooding. Flood depths and velocities in this area are shown to be between 0.15 and 0.30 m and less than 0.25 m/s respectively.

[7] Broughton Brook Viability Study, Final Modelling Report March 2008, Halcrow

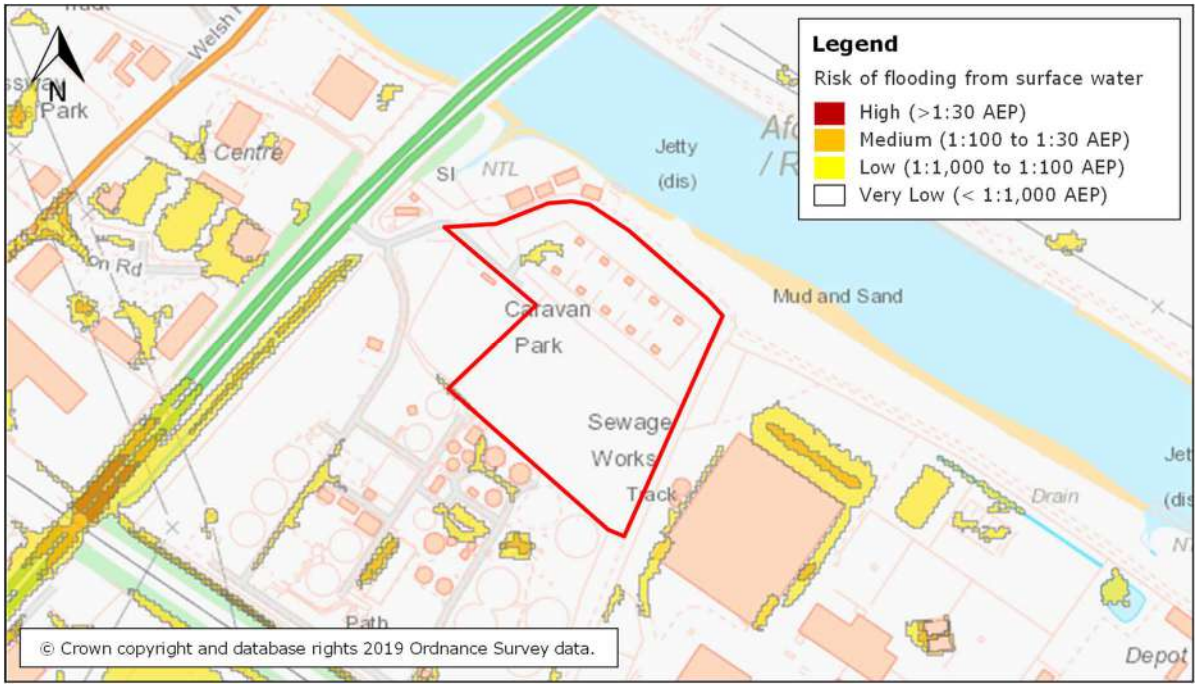


Figure 5: Surface Water Flood Risk
(Source: NRW website)

Dŵr Cymru Welsh Water (DCWW) has been consulted[8] to ascertain whether it holds any records of sewer flooding at or within the vicinity of the site. At the time of writing a response is awaited.

FCC has been consulted[9] to ascertain whether it holds any records of highways flooding at or within the vicinity of the site. At the time of writing a response is awaited.

4.7 FLOOD RISK FROM RESERVOIRS, CANALS AND OTHER ARTIFICIAL SOURCES

There are no canals or other impounded waterbodies located within the immediate vicinity of the site. The Reservoir Flood Risk map indicates that the site is not at risk of flooding from such sources. The site is therefore not assessed to be at risk of flooding from reservoirs, canals or other artificial sources.

4.8 FLOOD RISK FROM GROUNDWATER

According to the BGS Groundwater Flooding Hazard map (**Figure 6**) the susceptibility to groundwater flooding across the majority of the site is assessed to be moderate to significant.

However, the site is impermeable and the emergence of groundwater at the site is considered unlikely. There are no identified historic flooding incidents from groundwater at the site.

[8] Email from Weetwood to DCWW dated 24 July 2019
[9] Email from Weetwood to FCC dated 23 July 2019

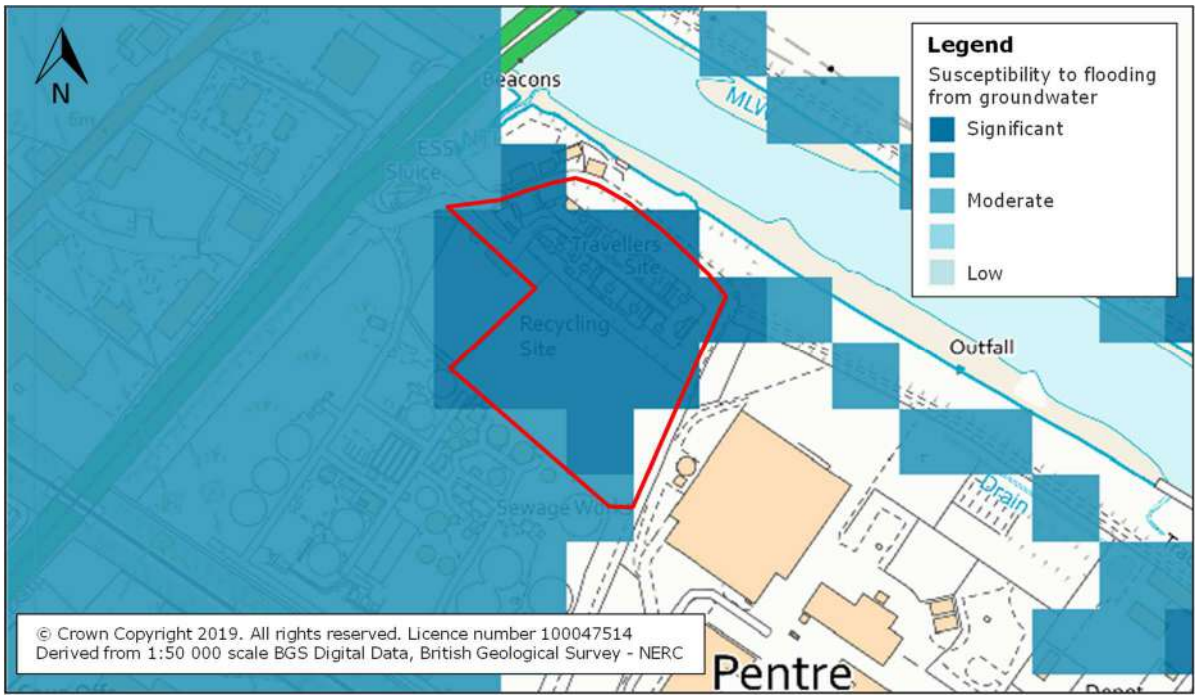


Figure 6: Groundwater Flooding Hazard Map
(Source: Findmaps)

5 FLOOD RISK MITIGATION MEASURES

The flood risk to the site from the River Dee and any residual risk from surface water and groundwater will be mitigated though the implementation of the measures proposed within the following section of this report.

5.1 DEVELOPMENT PLATFORM LEVEL

In accordance with A1.14 of TAN15, the ground level of the development platform should be set to a minimum level of 7.19 m AOD. This provides a freeboard of 300 mm above the 1:200 (2120) annual probability tidal breach flood level expected at the site.

The proposed platform level would also be 180 mm above the flood level expected during a 1:1,000 (2120) annual probability tidal breach flood level expected at the site.

5.2 FINISHED FLOOR LEVELS

Finished floor levels of buildings should be set at a minimum of 0.15 m above the development platform level.

This will, subject to the implementation of an appropriately designed surface water drainage scheme (**Section 6**), enable any potential overland flows to be conveyed safely across the site without affecting property.

5.3 COMPENSATORY FLOOD STORAGE AREA

As there will be some land raising within the tidal-breach floodplain, it is proposed to lower ground levels within the wider land ownership boundary to compensate for the loss of floodplain storage.

The proposed Flood Storage Area (FSA) is shown in **Figure 7**, comprising “FSA1” and “FSA2” that will be located within the wider-site ownership boundary to the east of the development site.

FSA1 has an approximate area of 5,100 m² with an average ground level of 6.62 m AOD, which will be lowered to a level of 6.50 m AOD. FSA2 has an approximate area of 880 m² with an average ground level of 7.82 m AOD, which will be lowered to a level of 5.50 m AOD.

Details of the FSA’s should be considered at the detailed design stage and may be subject to refinement.

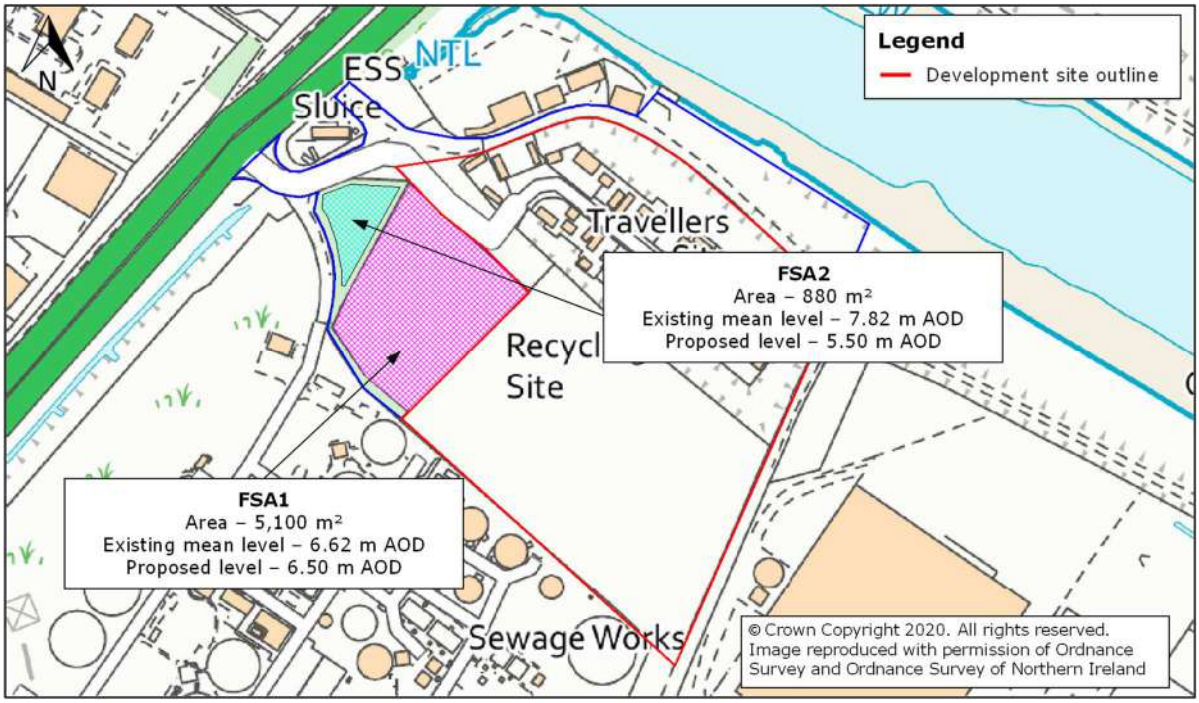


Figure 7: Proposed Flood Storage Area

5.4 FLOOD RISK ELSEWHERE

Any proposal to modify ground levels should demonstrate that there is no increase in flood risk to the development itself, or to any existing buildings which are known to, or are likely to flood.

In accordance with A1.2 of TAN15 the consequences of the development on flood risk elsewhere should be assessed for up to the 1:1,000 annual probability event. It is understood that NRW seek to ensure that, where necessary, climate change and breach and blockage scenarios are considered for assessing the impact on flood risk elsewhere.

The proposed development platform has been incorporated into the NRW tidal River Dee hydraulic model, which has been re-run for the 1:200 (2120) and 1:1,000 (2120) annual probability breach events in order to be able to establish potential impacts to third parties when compared to the baseline scenario.

The proposed scenario modelled outputs are provided in **Appendix E**. 'Comparison plots' presenting changes in flood risk between the baseline and proposed scenario have been provided in **Appendix F**.

The modelled outputs indicate that flood depths would be expected to decrease to the south and west of the site by approximately 16 and 10 mm during the 1:200 (2120) and 1:1,000 (2120) annual probability events respectively. Flood risk to the existing pumping station to the north-west of the site is shown to significantly decrease during a 1:1,000 (2120) annual probability event by 600-700 mm.

In light of the above, flood risk elsewhere is not considered to be adversely impacted as a result of the proposed development.

5.5 FLOOD PLAN

Given that flooding may be expected around the site, including the access routes, it is recommended that a Flood Plan is prepared in consultation with FCC emergency planning team.

The objectives of the plan would be to:

- Ensure all residents are aware of the potential risk of flooding and the procedures that should be implemented in the event that flooding is expected or has occurred
- Reduce the risk to property and life
- Reduce the likelihood of anyone entering flood waters
- Reduce the likelihood of a disorganised response to potential or actual flooding

This would be achieved by setting out the measures that would need to be taken in the event that potential flooding is forecast, during flooding and following an 'all-clear' notification. The plan would achieve this by:

- Summarising the roles and responsibilities for flood response and management
- Describing how flood warnings are issued, flood warning codes and what they mean, and other sources of flood information
- Setting out how to respond safely in the event that flooding is forecast or occurs

The site is included in an NRW flood alert and warning area (**Figure 8**). This provides the opportunity for the relevant response procedures set out in the Flood Plan to be invoked in response to receipt of a flood warning from NRW.

Figure 8: Flood Warning Areas
(Source: NRW website)

6 SURFACE WATER MANAGEMENT

6.1 SURFACE WATER DRAINAGE AT THE EXISTING SITE

As shown in the topographic survey (**Appendix B**), the existing site is served by a formal drainage system comprising drainage channels and gullies. The details of this system are currently unknown but levels along the drainage channels are shown to fall to the north-west and it is therefore reasonable to assume that surface water currently discharges into Queensferry Drain located to the north-west of the site.

6.1.1 Existing Runoff Rates

The site has a total area of 3.08 ha. Existing impermeable areas have been estimated to be 2.34 ha based on **Appendix B**.

The greenfield runoff rate for the site has been calculated using the ICP SUDS method within MicroDrainage. Runoff rates from existing impermeable areas have been calculated using the Modified Rational Method. Details of the input parameters and the output results are provided in **Appendix G** and **Appendix H** respectively.

The runoff rates from the existing site are presented in **Table 3**. It is unlikely that the existing drainage system at the site was designed to convey such rates and therefore the existing runoff that exceeds the capacity of the drainage system would be expected to flow onto adjacent land and ultimately into Queensferry Drain.

Table 3: Peak Runoff Rate - Existing Site

Annual probability of rainfall event	**Permeable Runoff Rate** 0.74 ha (l/s)	**Impermeable Runoff Rate** 2.34 ha (l/s)	**Total** (l/s)
1:1	3.3	182.7	186.0
QBAR	3.8	236.4	240.2
1:30	6.6	446.9	453.5
1:100	8.1	574.8	582.9

6.2 SURFACE WATER DRAINAGE AT THE REDEVELOPED SITE

6.2.1 Disposal of Surface Water

In accordance with Welsh Government guidance, surface water runoff should be disposed of according to the following hierarchy: Rainwater collected for use; Into the ground (infiltration); To a surface water body; To a surface water sewer or highway drain; To a combined sewer.

As part of the drainage strategy on site, a rainwater harvesting system could be considered to collect non-potable water for reuse where possible. This could include the installation of water butts, which would reduce demand on potable water supplies. However, the incorporation of rainwater harvesting systems within dwellings will require pumped systems. In accordance with the principles of the SuDS standards, the use of pumping should be avoided where possible. Therefore, priority level 1 has been discounted as the primary method for disposal of surface water.

As detailed in **Section 3.4** the site is underlain by soils with impeded drainage. As such the disposal of surface water via infiltration is unlikely to be feasible; however, infiltration tests have not been undertaken at this

stage. Such tests should be undertaken at the detailed design stage in accordance with the guidelines in BRE365[10].

For the purposes of this report, it is assumed that runoff will continue to be directed to Queensferry Drain located approximately 40 m west of the site.

6.2.2 Post Development Impermeable Area

The area of impermeable surfaces within the development has been assumed to be 3.08 ha (100% impermeable). This is a conservative approach and will allow for flexibility at the detailed design stage.

6.2.3 Peak Flow Control

For sites which were previously developed, the peak runoff rate from the proposed development to any drain, sewer or surface water body for the 1:1 annual probability rainfall event and the 1:100 annual probability rainfall event must be as close as reasonably practicable to the greenfield runoff rate for the same rainfall event, but should not exceed the rate of discharge from the site prior to redevelopment for that event.

Paragraph G2.24 of the 2.1.2.2 Statutory Standards for Sustainable Drainage Systems states that for run off rates *'For previously developed sites, site runoff rates should be reduced to the greenfield rates wherever possible'*.

Therefore, for the purposes of this assessment surface water runoff from the redeveloped site will be restricted to the existing greenfield 1:100 annual probability rate for the site and as such will provide significant betterment when compared to the existing situation (refer to **Table 3**). Based on **Appendix G**, the existing greenfield 1:100 annual probability runoff rate is 33.9 l/s.

6.2.4 Volume Control

Where reasonably practicable, for sites which have been previously developed, the runoff volume from the proposed development to any highway drain, sewer or surface water body in the 1:100 annual probability, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event.

As outlined above, discharge rates are being limited to a rate of 33.9 l/s, which should be considered sufficient to mitigate increased volumes of surface water resulting from increased impermeable areas at the site post development. It should be noted that the existing QBAR rate into Queensferry Drain is assessed to be in the region of 240.2 l/s.

6.2.5 Attenuation Storage

Attenuation storage will be provided to restrict surface water runoff generated across roofs and hardstanding.

The attenuation storage facility has been modelled using the Detailed Design module of MicroDrainage Source Control (**Appendix I**). The required storage volume has been sized to store the 1:100 annual probability rainfall event including a 30% increase in rainfall intensity in order to allow for climate change.

Assuming a peak discharge rate of 33.9 l/s and a design depth of 1.0 m, a total storage volume of 1,536.4 m^3 would be required.

The storage volume could be accommodated within a detention basin, with an approximate area of 1,885 m^2 and a depth of 1.3 m, which would fill to a depth of 1.0 m providing a freeboard of 0.3 m. Given the available

[10] BRE Digest 365: Soakaway Design

area at the site for surface water storage, it may be that the proposed storage volume is provided over two separate structures which will also assist with the 2-phase proposals to construct the southern portion of the site whilst keeping the existing northern development in situ (refer to **Appendix A**).

For the purposes of this report the calculations assume that all storage is provided within a single attenuation storage facility; with no storage being provided in the proposed pipe network. As such, the volumes of storage presented are likely to be an overestimate.

6.2.6 Preliminary Surface Water Drainage Layout

Figure 9 provides a preliminary surface water drainage layout for the site. An approximate area of 4,100 m^2 is available, both on-site and within the land ownership boundary, to accommodate surface water storage, which should be ample to accommodate the attenuation volume discussed in **Section 6.2.5**.

Additional SuDS features such as filter drains and permeable paving may be incorporated into the surface water drainage strategy at the detailed design stage.

Figure 9: Preliminary Surface Water Drainage Layout

6.2.7 Exceedance Routes

Flows resulting from rainfall in excess of the 1:100 annual probability rainfall event including an allowance for climate change will be managed in exceedance routes. It is assumed that as the development proposals progress, the design of the site would ensure flood flows are directed towards carriageways, with the site being profiled to ensure that flood flows are directed away from built development.

6.2.8 Water Quality and Pollution Control

Residential roofs have a very low pollution hazard level and individual property driveways and low traffic roads have a low pollution hazard level. Table 26.2 of the CIRIA SuDS Manual 2015 indicates that the combined pollution hazard indices associated with residential roofs, individual property driveways and low traffic roads for total suspended solids, hydrocarbons and metals are 0.70, 0.60 and 0.45 respectively. The indices range from 0 (no pollution hazard) to 1 (high pollution hazard).

Table 26.3 of the CIRIA SuDS Manual 2015 indicates that the combined SuDS mitigation indices for detention basins and permeable paving for total suspended solids, hydrocarbons and metals are 0.95, 0.85 and 1.0 respectively. As such, the proposed drainage system would incorporate adequate water quality treatment.

6.2.9 Amenity and Biodiversity

As discussed in **Section 6.2.5**, the required storage volume may be accommodated within detention basins on site and permeable paving structures on site.

These SuDS features are normally dry and in certain situations the land may also function as a recreational facility or a habitat for wildlife [11]. Therefore, amenity and biodiversity opportunity may increase as a result of the implementation of SuDS features.

6.2.10 Adoption and Maintenance of SuDS

The pipe network, designed to Sewers for Adoption (7th edition) standard, may be adopted by the sewerage undertaker.

SuDS in open spaces may be maintained by a management company or the SAB.

An indicative maintenance schedule is presented in **Table 4**.

Table 4: Maintenance Requirements

Schedule	Required action	Frequency
Attenuation Basin		
Regular maintenance	Remove litter and debris	Monthly
	Cut grass	Monthly during grow season Or as required)
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies	Monthly for first year, then annually or as required

[11] https://www.susdrain.org/delivering-suds/using-suds/suds-components/infiltration/infiltration_trench.html

Schedule	Required action	Frequency
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets/outlets	Annually (or as required)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every two years, or as required
	Remove sediments from inlets/outlets and main basin when required	
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	
	Repair/rehabilitation of inlets/outlets	
	Relevel uneven surface and reinstate design levels	
Permeable Paving		
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations.
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosphate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth- if required, take remedial action	Three-monthly, 48h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies accumulation rates and establish appropriate removal frequencies	Annually
	Monitor inspection chambers	

6.2.11 Summary

The purpose of this report is to demonstrate that a surface water drainage strategy is feasible for the site given the development proposals and the land available. The proposals provide the opportunity for the inclusion of SuDS elements, ensuring that there will be no increase in surface water runoff from the proposed development. The storage calculations may be refined at the detailed design stage and a final decision made on the types of storage to be provided.

7 SUMMARY

This FCA has been prepared on behalf of Flintshire County Council and relates to the proposed redevelopment of the existing Gypsy and Traveller site at Riverside, Queensferry

According to the Development Advice Map the site is located within Zone C1.

Parts i and iii of the Justification Test are deemed to have been met. This report addresses part iv of the Justification Test.

The site is unlikely to be significantly impacted by tidal flood risk during overtopping conditions in up to a 1:1,000 (2120) annual probability event. Some flooding of the site may occur in the south-west in the event of a tidal breach; however, the majority of the site is shown to remain dry. Flooding of the proposed new access route to the site may be expected during the breach scenarios.

The site is not assessed as being at risk from fluvial sources.

The majority of the site is at a 'very low' risk of surface water flooding. However, there is a small area on site towards the northern boundary that is shown to be at 'low' risk of surface water flooding. Flood depths and velocities in this area are shown to be between 0.15 and 0.30 m and less than 0.25 m/s respectively.

The site is not assessed as being at risk of flooding from reservoirs, canals or other artificial waterbodies.

The susceptibility to groundwater flooding across the majority of the site is assessed to be moderate to significant. However, the emergence of groundwater at the site appears unlikely.

The ground level of the development platform should be set to a minimum level of 7.19 m AOD. This provides a freeboard of 300 mm above the 1:200 (2120) annual probability tidal breach flood level expected at the site.

Finished floor levels of buildings should be set a minimum of 0.15 m above the development platform level.

It is proposed to lower ground levels within the site ownership boundary in order to compensate for the loss of floodplain storage during tidal breach scenarios.

The proposed development is not considered to adversely impact flood risk elsewhere.

It is recommended that a Flood Plan is prepared in consultation with FCC Emergency Planners. The site is located within a NRW flood warning area.

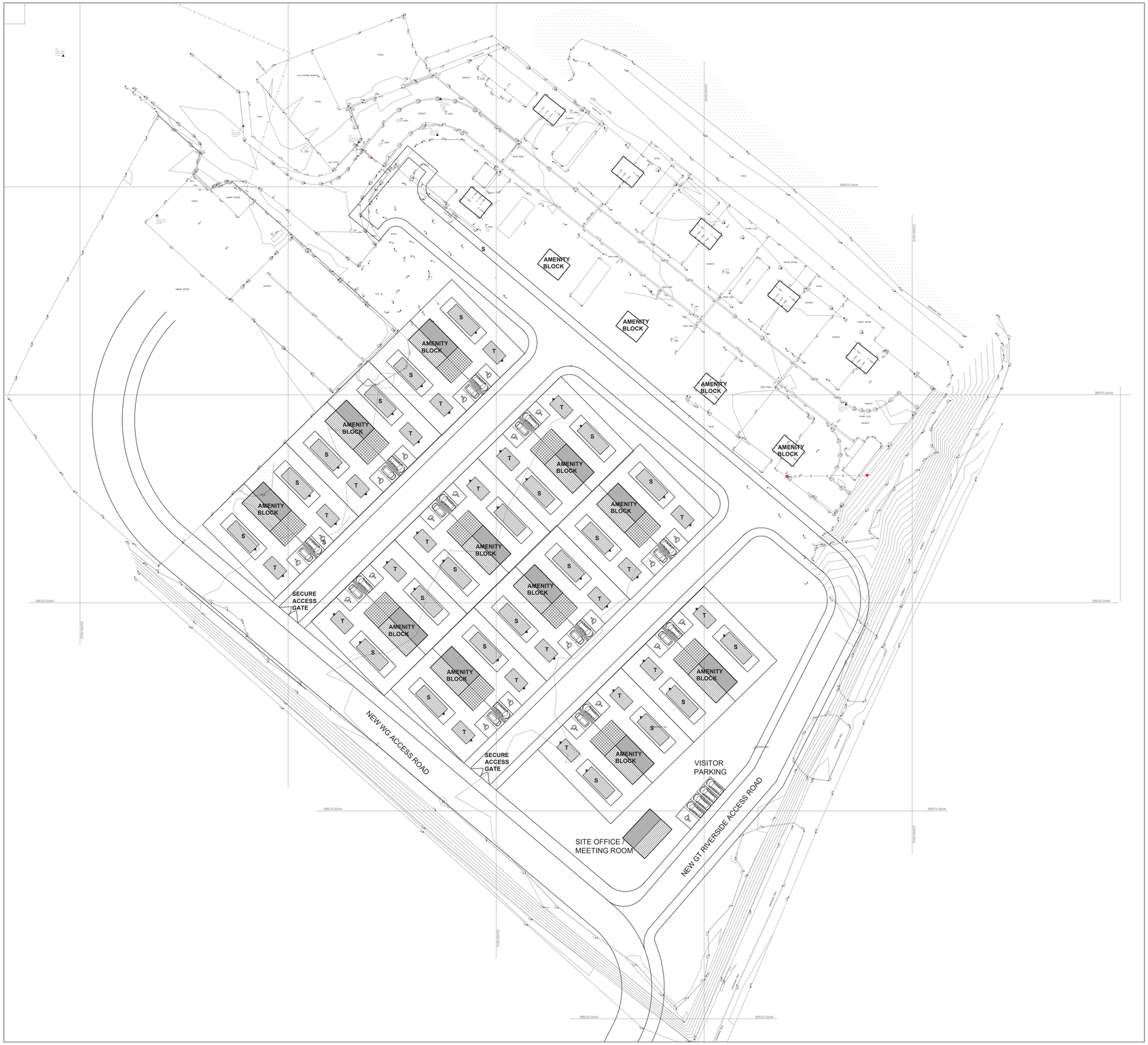
Surface water runoff from the developed site can be sustainably managed in accordance with TAN15 and local policy.

8 RECOMMENDATIONS

This report has demonstrated that the proposed development may be completed in accordance with the requirements of planning policy subject to the following:

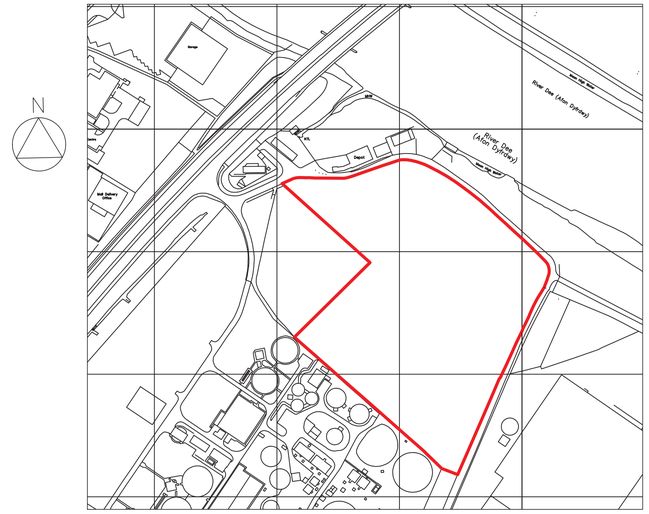
- Development platform level to be set at a minimum of 7.19 m AOD
- Finished floor levels to be set 0.15 m above the development platform level
- A compensatory flood storage scheme to be developed in accordance with the principles set down in this FCA, should be submitted to and approved by the local planning authority prior to the commencement of development.
- Flood Plan to be developed in consultation with Flintshire County Council
- The detailed drainage design to be submitted to and approved by the local planning authority prior to the commencement of development

APPENDIX A:	Development Proposals

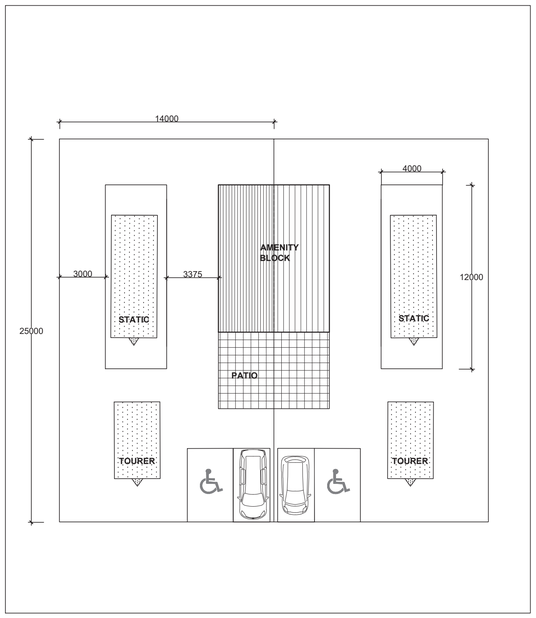


PROPOSED SITE PLAN scale 1:500

22 NO. PITCHES



LOCATION PLAN scale 1:2500



PROPOSED PITCH PLAN scale 1:200

PITCH AREA - 350 M2

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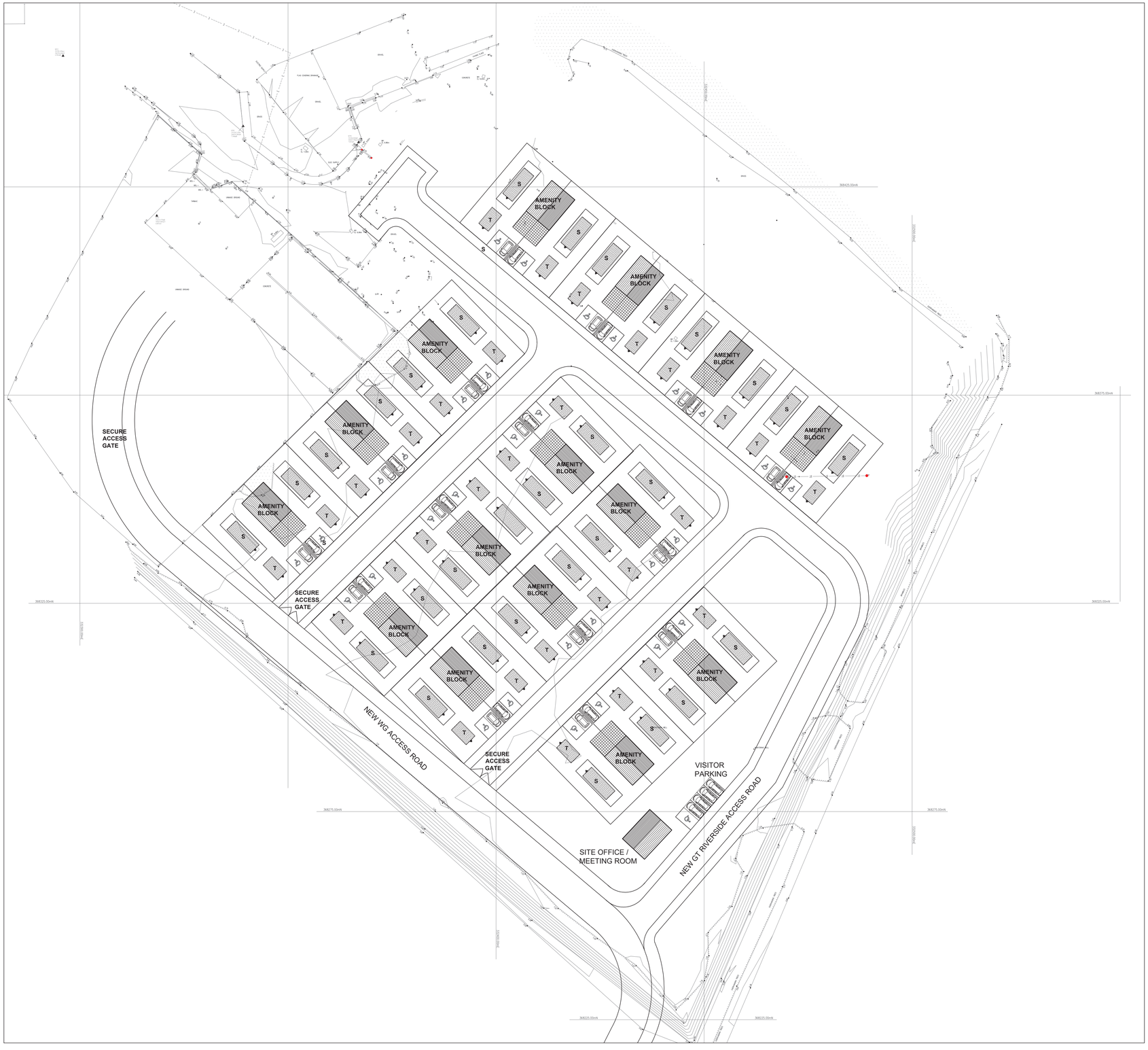
This drawing must not be scaled. Dimensions are in millimetres unless specified otherwise.

PROJECT
PROPOSED REDEVELOPMENT OF GT RIVERSIDE, QUEENSFERRY, FLINTSHIRE,

DRAWING
PROPOSED SITE PLAN & LOCATION PLANS PHASE 1

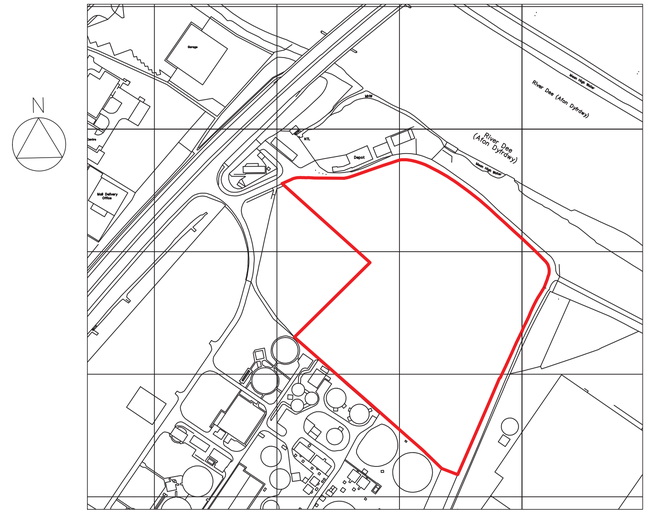
STATUS: PLANNING
DATE: DECEMBER 2018
SCALE: 1:500 & 1:2500@ A1
PROJECT NO: JW081
DRWG NO: AK081/11
REV: .

CYNGOR Sir y Fflint Flintshire COUNTY COUNCIL
COUNTY OFFICES, FLINT
FLINTSHIRE, CH6 5BD
tel: 01352 752121



PROPOSED SITE PLAN scale 1:500

30 NO. PITCHES



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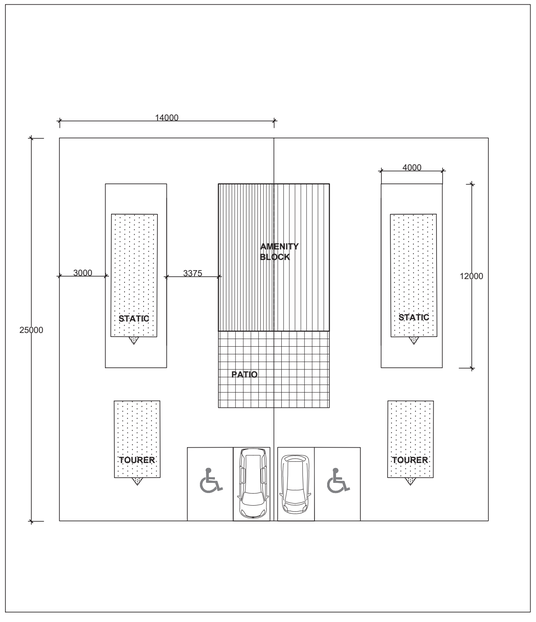

PROPOSED PITCH PLAN scale 1:200

PITCH AREA - 350 M2

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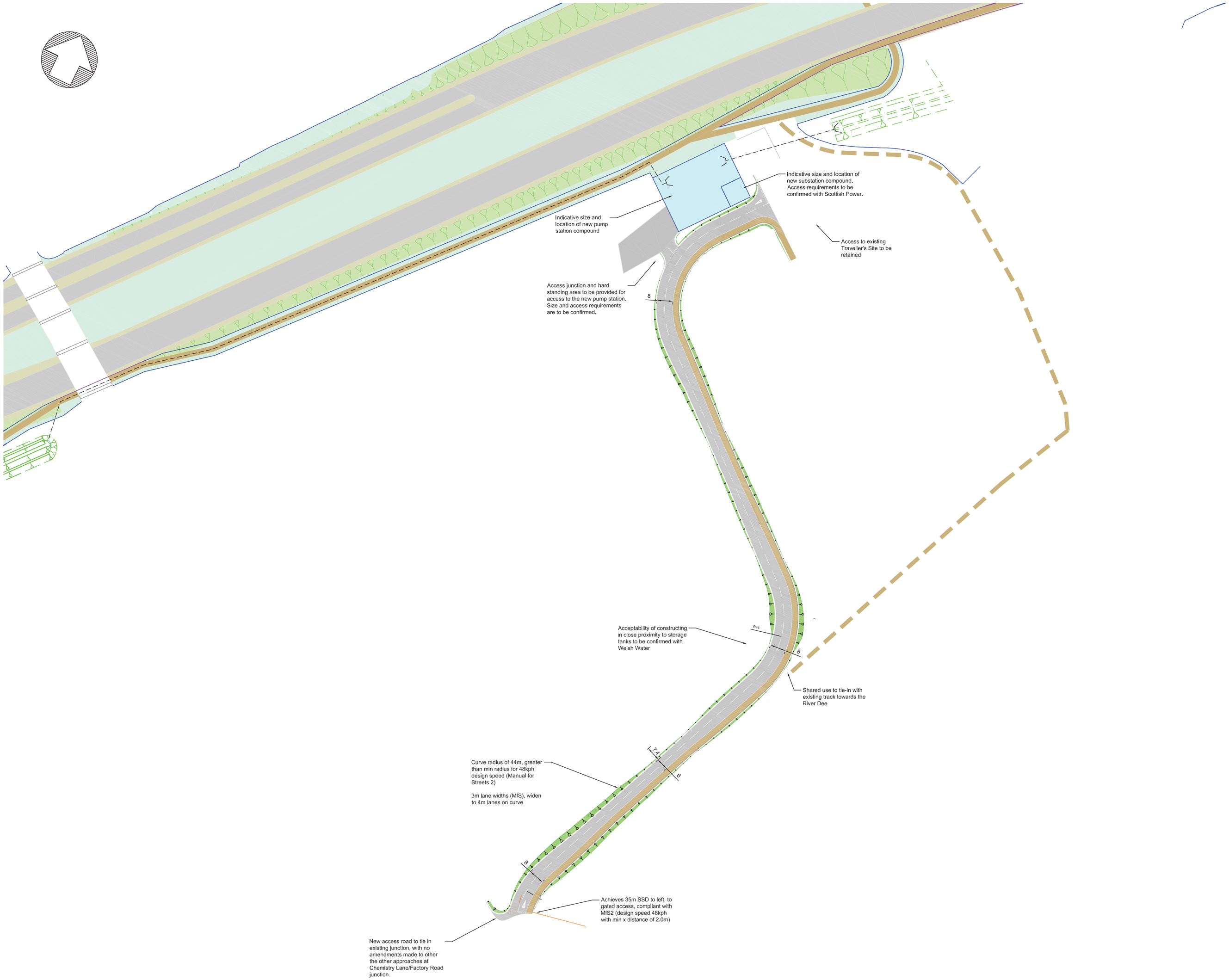
This drawing must not be scaled. Dimensions are in millimetres unless specified otherwise.

PROJECT
PROPOSED REDEVELOPMENT OF GT RIVERSIDE, QUEENSFERRY, FLINTSHIRE,

DRAWING
PROPOSED SITE PLAN & LOCATION PLANS PHASE 2

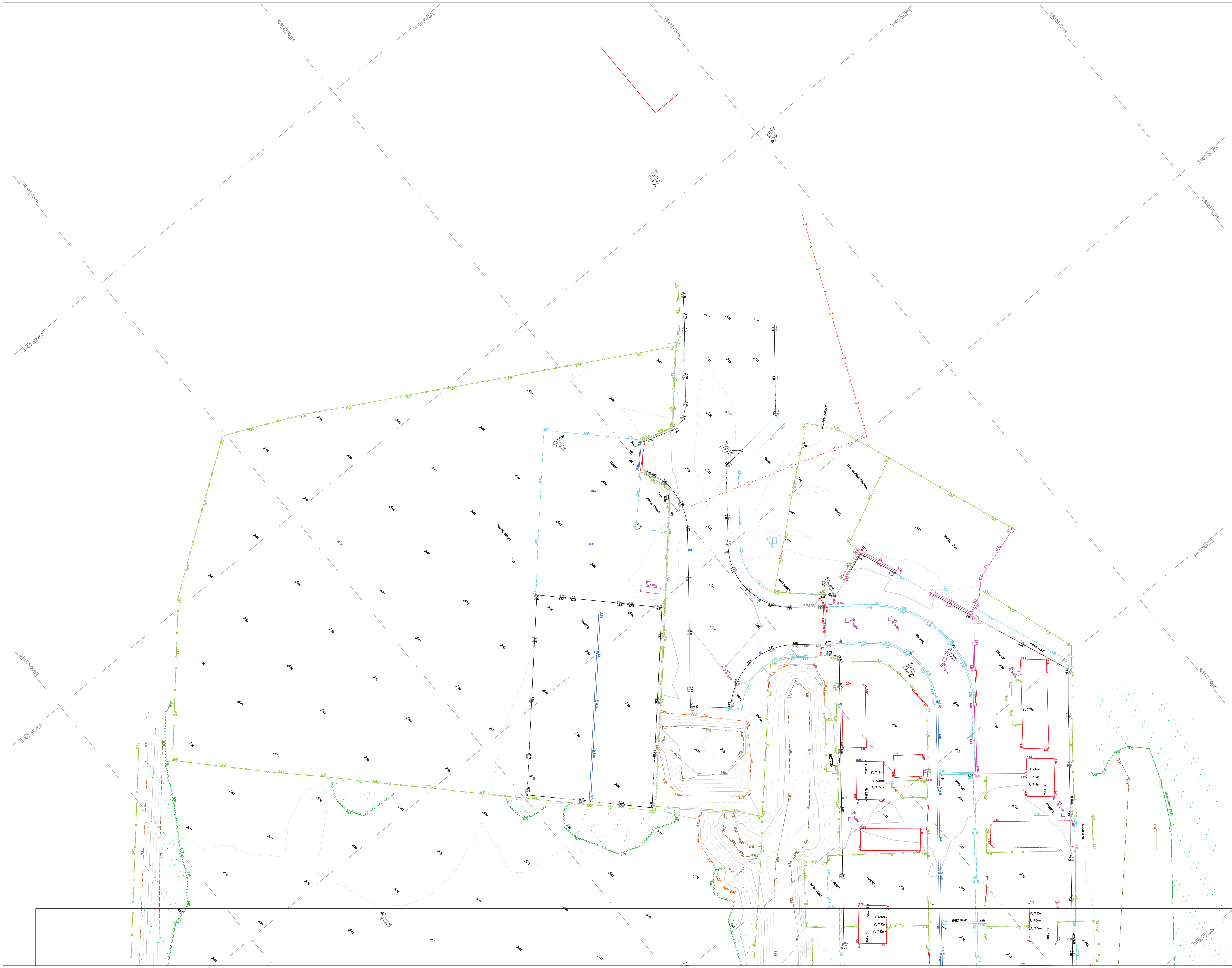
STATUS: PLANNING
DATE: DECEMBER 2018
SCALE: 1:500 & 1:2500@ A1
PROJECT NO: JW081
DRWG NO: AK081/12
REV: .

CYNGOR Sir y Fflint Flintshire COUNTY COUNCIL
COUNTY OFFICES, FLINT
FLINTSHIRE, CH6 5BD
tel: 01352 752121

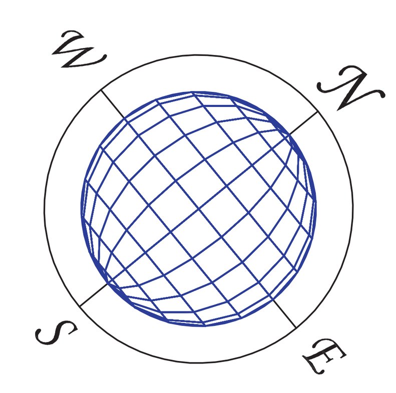

Indicative size and location of new substation compound. Access requirements to be confirmed with Scottish Power.
Indicative size and location of new pump station compound
Access to existing Traveller's Site to be retained
Access junction and hard standing area to be provided for access to the new pump station. Size and access requirements are to be confirmed.
8
Acceptability of constructing in close proximity to storage tanks to be confirmed with Welsh Water
R44
8
Shared use to tie-in with existing track towards the River Dee
Curve radius of 44m, greater than min radius for 48kph design speed (Manual for Streets 2)
3m lane widths (MfS), widen to 4m lanes on curve
7.4
6
6
Achieves 35m SSD to left, to gated access, compliant with MfS2 (design speed 48kph with min x distance of 2.0m)
New access road to tie in existing junction, with no amendments made to other the other approaches at Chemistry Lane/Factory Road junction.

DRAFT

APPENDIX B:	Topographic Survey



Site Grid North



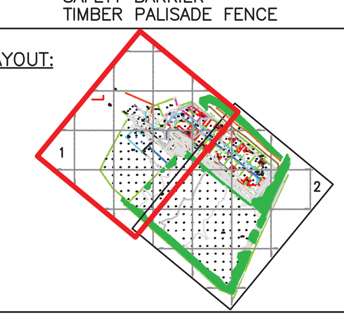
Symbols/Abbreviations (Where Applicable):

AV:	AIR VALVE
BB:	BELISHA BEACON
BH:	BOREHOLE
BM:	BENCHMARK
BOL:	BOLLARD
B/S:	BUS STOP
CAM:	CAMERA
CS:	CABLE STAY
CATV:	C.A.T.V INSPECTION CHAMBER
CBOX:	ELECTRICITY BOX, CABLE BOX, ETC.
CCTV:	C.C.T.V CAMERA
C.PIT:	CATCH PIT
EC:	ELECTRICITY COVER
EP:	ELECTRICITY POLE
ER:	EARTH ROD
FH:	FIRE HYDRANT
FP:	FLAG POLE
G:	GULLY
G:	GULLY (ROUND)
GV:	GAS VALVE
IC:	INSPECTION COVER (SQUARE)
IC:	INSPECTION COVER (ROUND)
IL:	INVERT LEVEL
KO:	KERB OUTLET
LB:	LETTER BOX
LC:	LIGHTING COLUMN
LP:	LAMP POST
LP/BS:	LAMP POST/BUS STOP
MH:	MANHOLE (SQUARE)
MH:	MANHOLE (ROUND)
MKR:	MARKER
P:	POST
RE:	RODDING EYE
R/S:	ROAD SIGN
S/P:	SIGN POST
SNP:	STREET NAME PLATE
ST:	STOP TAP
SV:	STOP VALVE
TCB:	TELEPHONE CALL BOX
TL:	TRAFFIC LIGHT
TP:	TELEGRAPH POLE
TP/EP:	TELEGRAPH POLE/ELECTRIC POLE
T/IC:	TELECOM INSPECTION COVER
WO:	WATER OUTLET
WM:	WATER METER
	GATE
	DEFINED POINT
	CONTROL POINT
	TREE (CONIFEROUS)
	TREE (DECIDUOUS)
	FOLIAGE
	HEDGE
DPC 99.99m	DAMP PROOF COURSE LEVEL
EL 99.99m	EAVES LEVEL
FL 99.99m	FLOOR LEVEL
RL 99.99m	RIDGE LEVEL
SL 99.99m	SOFFIT LEVEL
TL 99.99m	THRESHOLD LEVEL

FENCE DESCRIPTIONS:

B/W:	BARBED WIRE FENCE
C/B:	CLOSE BOARDED FENCE
C/L:	CHAIN LINK FENCE
C/P:	CHESTNUT PALING FENCE
CONC/P:	CONCRETE PANEL FENCE
I/R:	IRON RAILING FENCE
P/R:	POST AND RAIL FENCE
P/W:	POST AND WIRE FENCE
P/C:	POST AND CHAIN FENCE
S/PAL:	STEEL PALISADE FENCE
S/B:	SAFETY BARRIER
T/PAL:	TIMBER PALISADE FENCE

SITE LAYOUT:



Revision Information

Rev	Date	Description
A	13/06/18	Additional Survey area added

INFORMATION

1) Ordnance Survey co-ordinates and level are derived from OSTN02 and OSGM02, transformed from WGS84.

2) Only services located during the site survey are shown on this plan. Further investigation may be required to ascertain the full extent of the site services.

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NOTES

Ordnance Survey Bench Mark Used

	Location	Type	Value (m)
1			
2			

PM SURVEYS UK

PM Surveys UK Ltd
Unit 3, Queensferry Industrial Estate
Pentre
Flintshire, CH5 2DJ
Tel: 01244 952477
Email: info@pmsurveys.co.uk

Client Info

Flintshire County Council
Sharp Project Manager

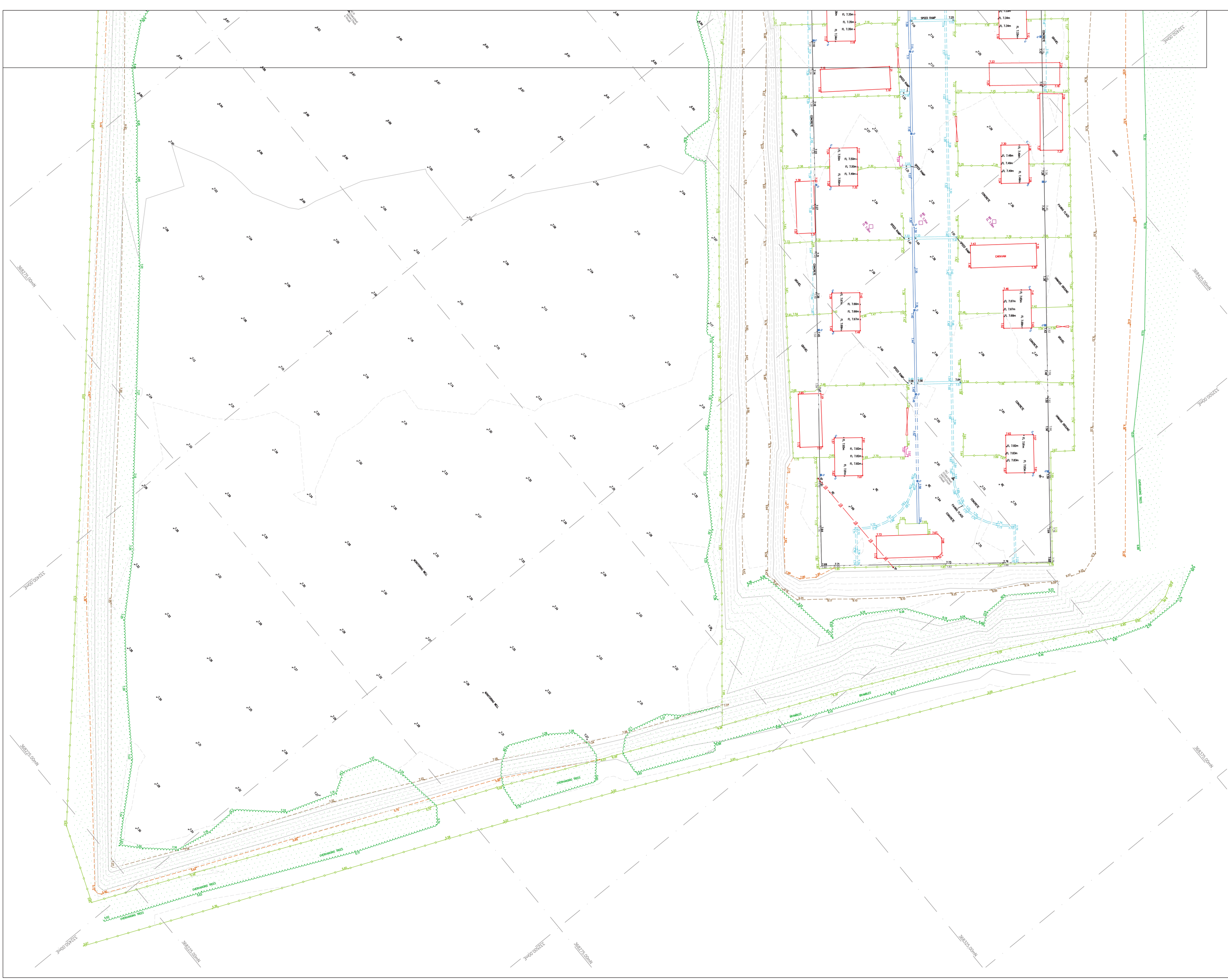
Tel: 07831 538549
Email: jeff.williams@flintshire.gov.uk

Project

GT Riverside, Queensferry

Project No	*Sheet:* A0	*Surveyed By:* NL
PMS18104	*Scale:* 1:200	*Drawn By:* JW
		Approved By: PM

Dwg PMS18104-01A *Issued:* 13/06/18



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N W E S

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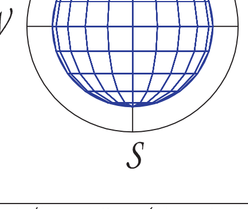

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Client Info

Flintshire County Council
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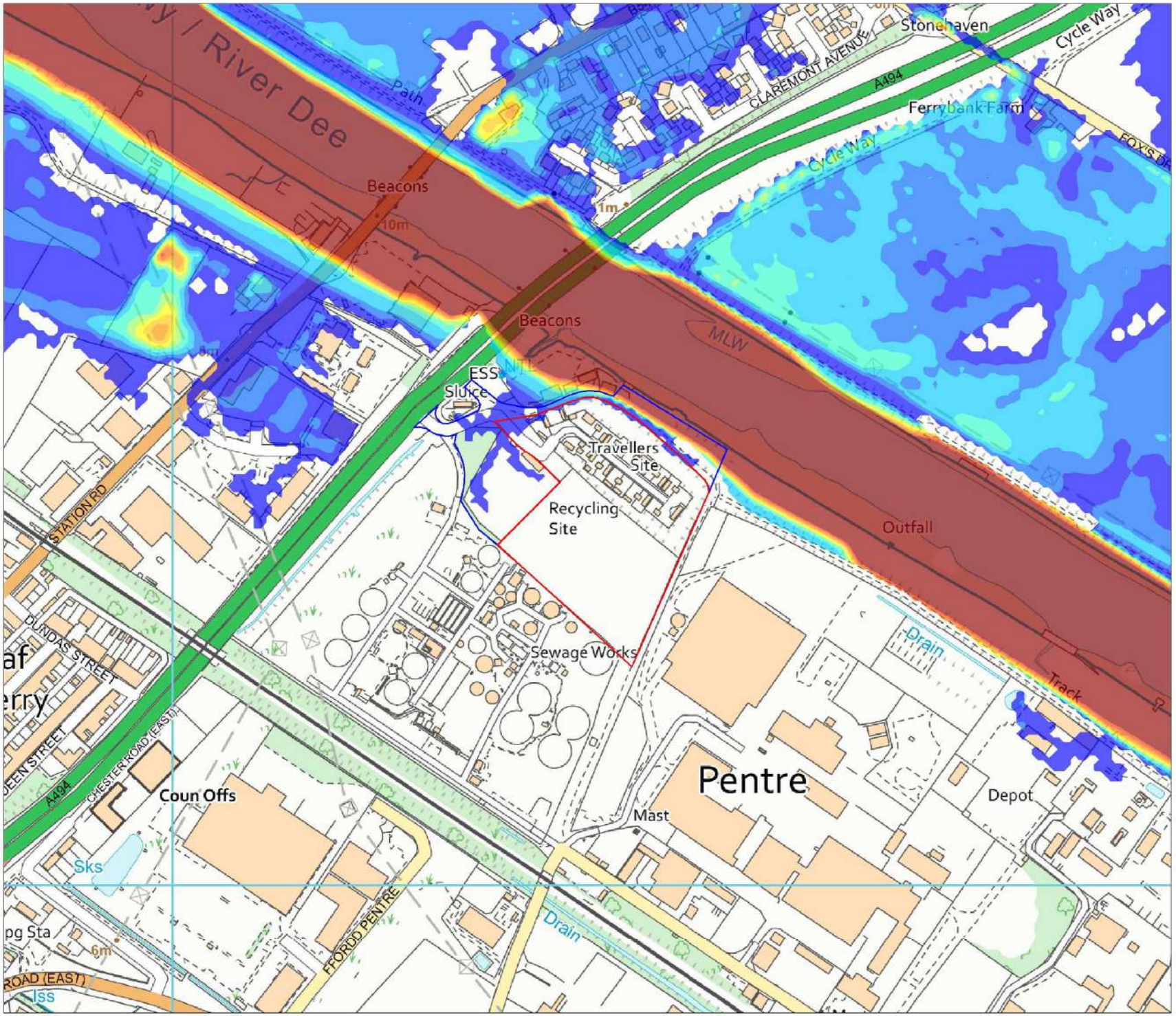
Tel: 07831 538549
Email: jeff.williams@flintshire.gov.uk

Project

GT Riverside, Queensferry

Project No PMS18104	Sheet: A0 Scale: 1:200	Surveyed By:	NL
		Drawn By:	JW
		Approved By:	PM
Dwg PMS18104-02A		Issued:	13/06/18

APPENDIX C:	Model Plot – Tidal Overtopping (Baseline)



Notes:

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KEY:

Site Location

Land Ownership

Depth (metres)

- 0.0 to 0.2
- 0.2 to 0.4
- 0.4 to 0.6
- 0.6 to 0.8
- 0.8 to 1.0
- 1.0 to 1.2
- 1.2 to 1.4
- 1.4 to 1.6
- 1.6 to 1.8
- 1.8 to 2.0
- > 2.0

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Development • Planning • Environment

Park House
Broncoed Business Park
Ffordd Byrnwr Gwair
Mold
CH7 1FQ

T: 01352 700045
E: info@weetwood.net
W: www. weetwood.net

Client: **Flintshire County Council**

Project Title: **Riverside, Queensferry**

Drawing Title: **Max Flood Depths; Overtopping Scenario (Baseline) 1:200 (2120) annual probability**

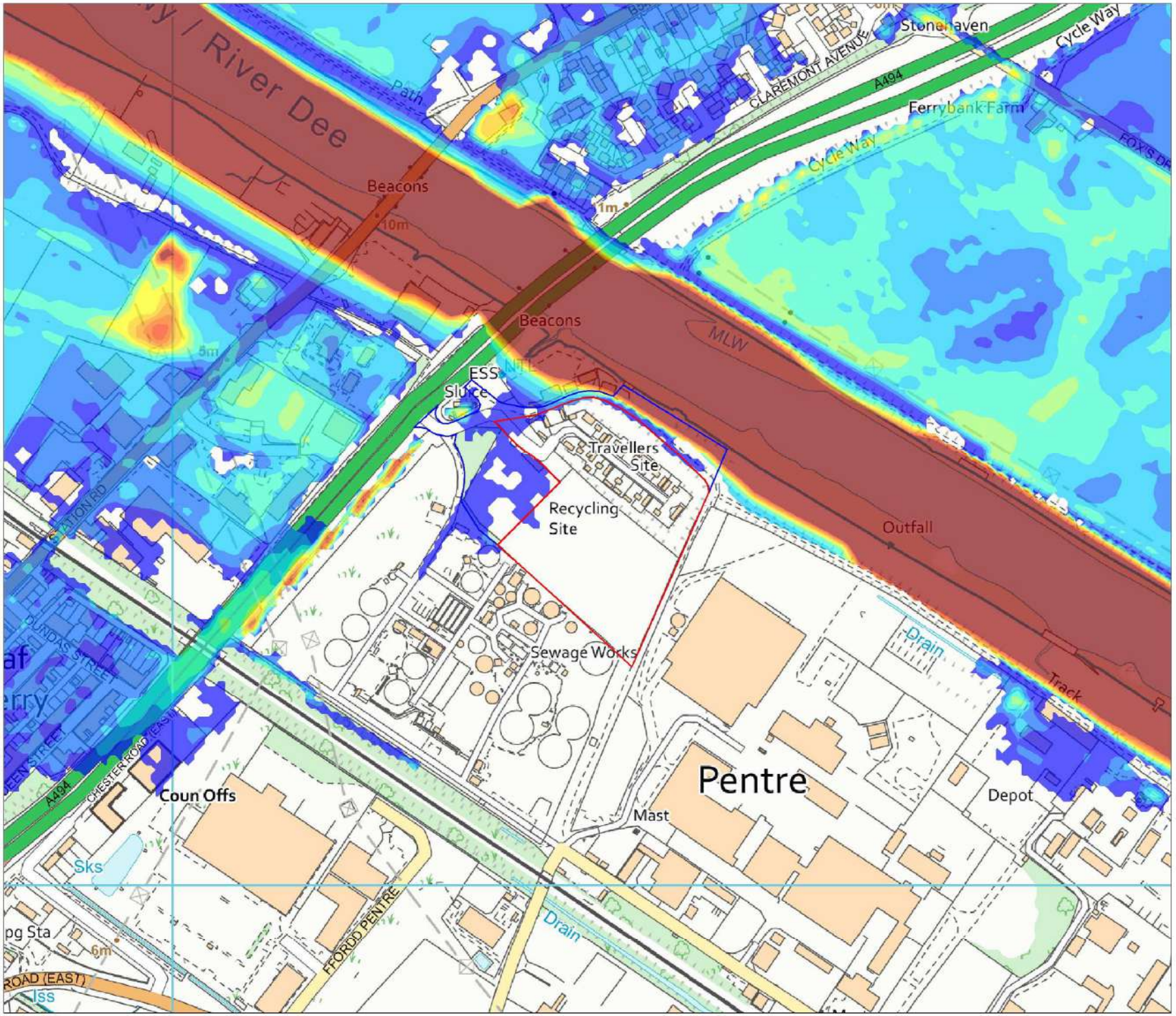
Map Orientation: N W E S

Scale: 0 50 100 metres

Drawn:	Checked:	Date:
AE	JA	26 November 2020

Drawing No: 4535_006_T0200_2120

Rev: A



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- 1.6 to 1.8
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Drawing Title: **Max Flood Depths; Overtopping Scenario (Baseline) 1:1,000 (2120) annual probability**

Map Orientation: N

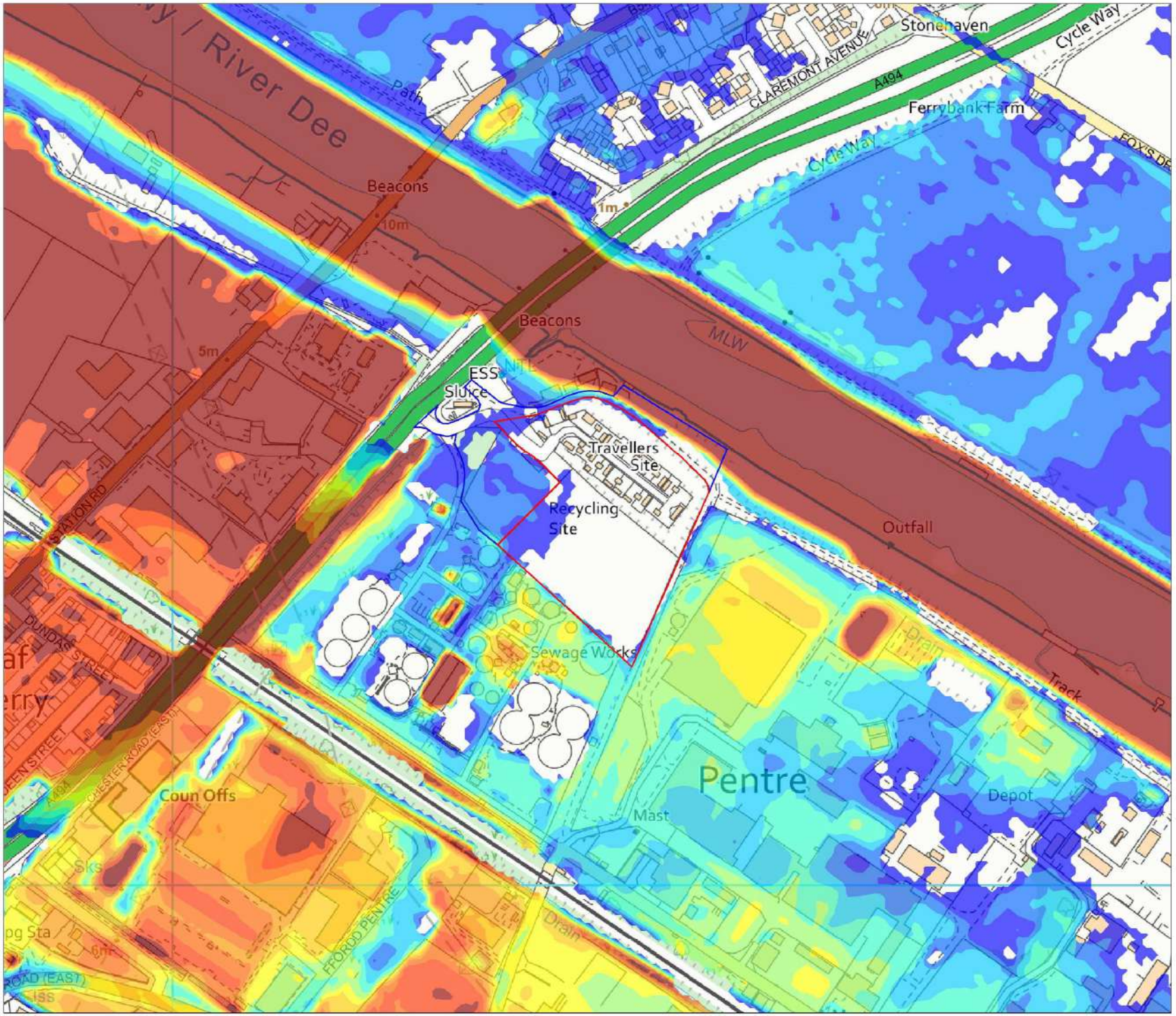
Scale: 0 50 100 metres

Drawn:	Checked:	Date:
AE	JA	26 November 2020

Drawing No: 4535_006_T1000_2120

Rev: A

APPENDIX D:	Model Plot – Tidal Breach (Baseline)



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Depth (metres)

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Client:
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Project Title:
Riverside, Queensferry

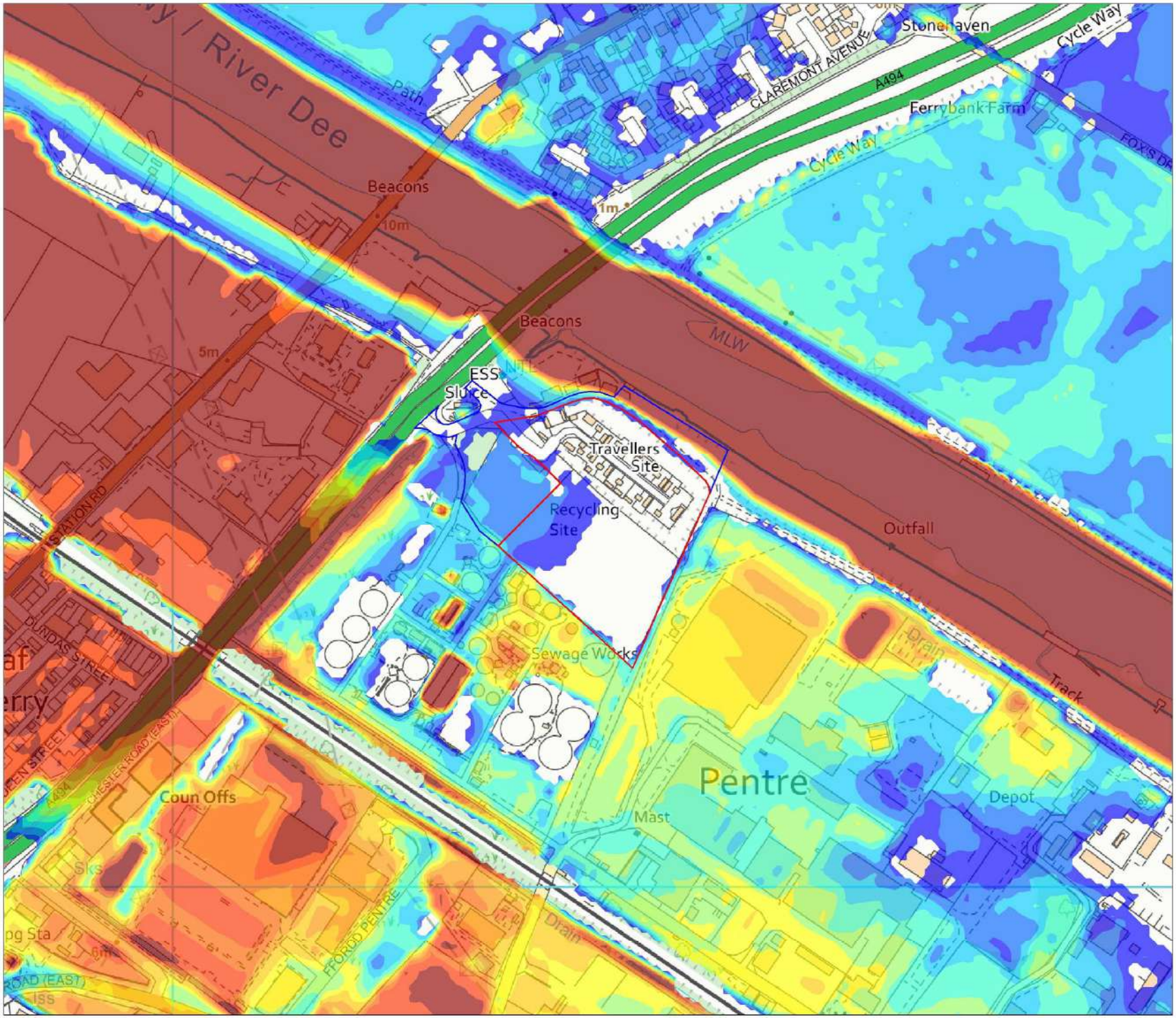
Drawing Title:
Max Flood Depths; Breach Scenario (Baseline) 1:200 (2120) annual probability

Map Orientation: N

Scale: 0 50 100 metres

Drawn:	Checked:	Date:
AE	JA	26 November 2020

Drawing No:	Rev:
4535_007_T0200_2120	A



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Depth (metres)

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Project Title:
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Drawing Title:
Max Flood Depths; Breach Scenario (Baseline) 1:1,000 (2120) annual probability

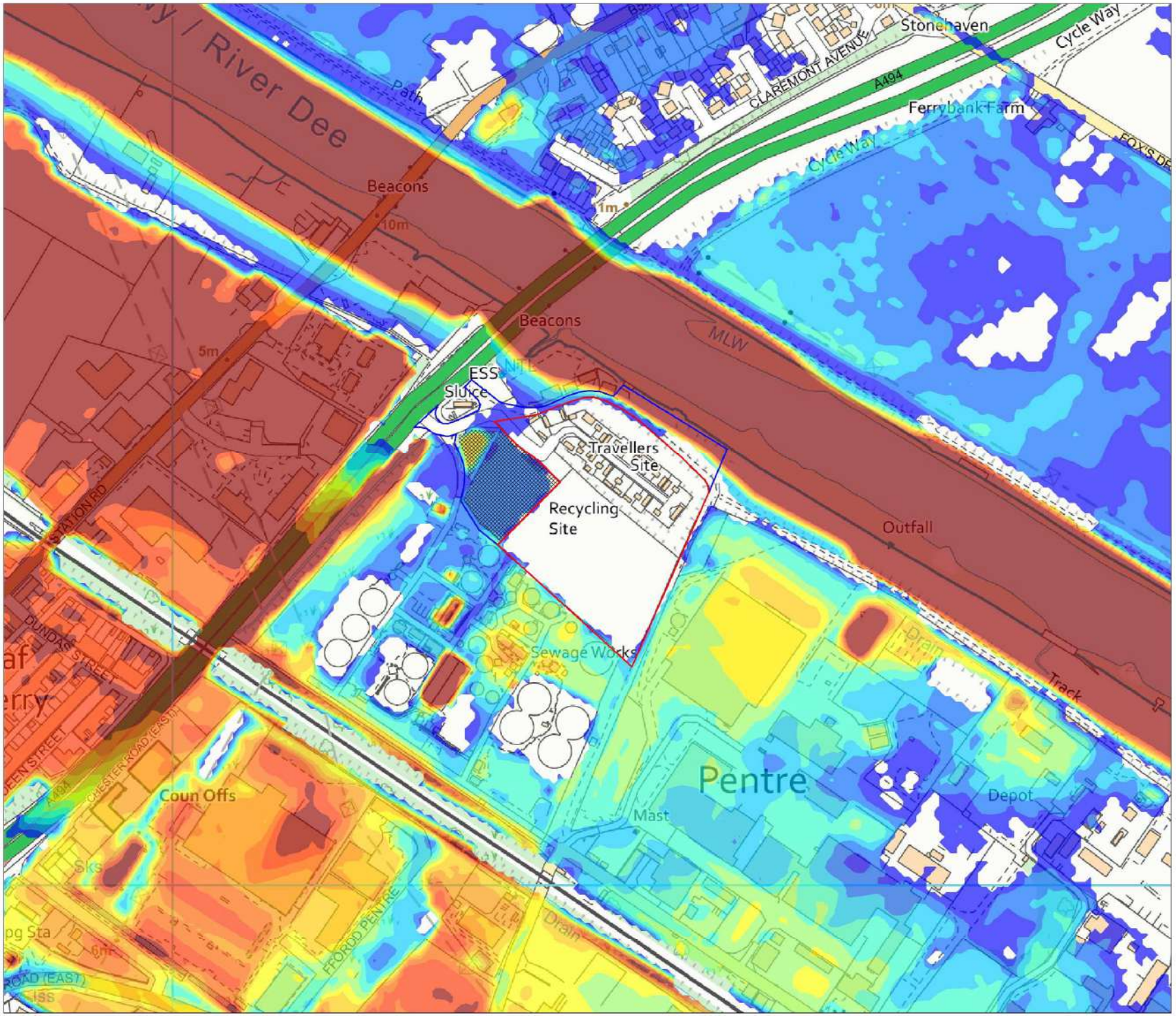
Map Orientation: N W E S

Scale: 0 50 100 metres

Drawn:	Checked:	Date:
AE	JA	26 November 2020

Drawing No:	Rev:
4535_007_T1000_2120	A

APPENDIX E:	Model Plot – Tidal Breach (Proposed)



Notes:

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KEY:

- Site Location
- Land Ownership
- Reprofiled land (Flood Storage)

Depth (metres)

- 0.0 to 0.2
- 0.2 to 0.4
- 0.4 to 0.6
- 0.6 to 0.8
- 0.8 to 1.0
- 1.0 to 1.2
- 1.2 to 1.4
- 1.4 to 1.6
- 1.6 to 1.8
- 1.8 to 2.0
- > 2.0

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Project Title: **Riverside, Queensferry**

Drawing Title: **Max Flood Depths; Breach Scenario (Proposed) 1:200 (2120) annual probability**

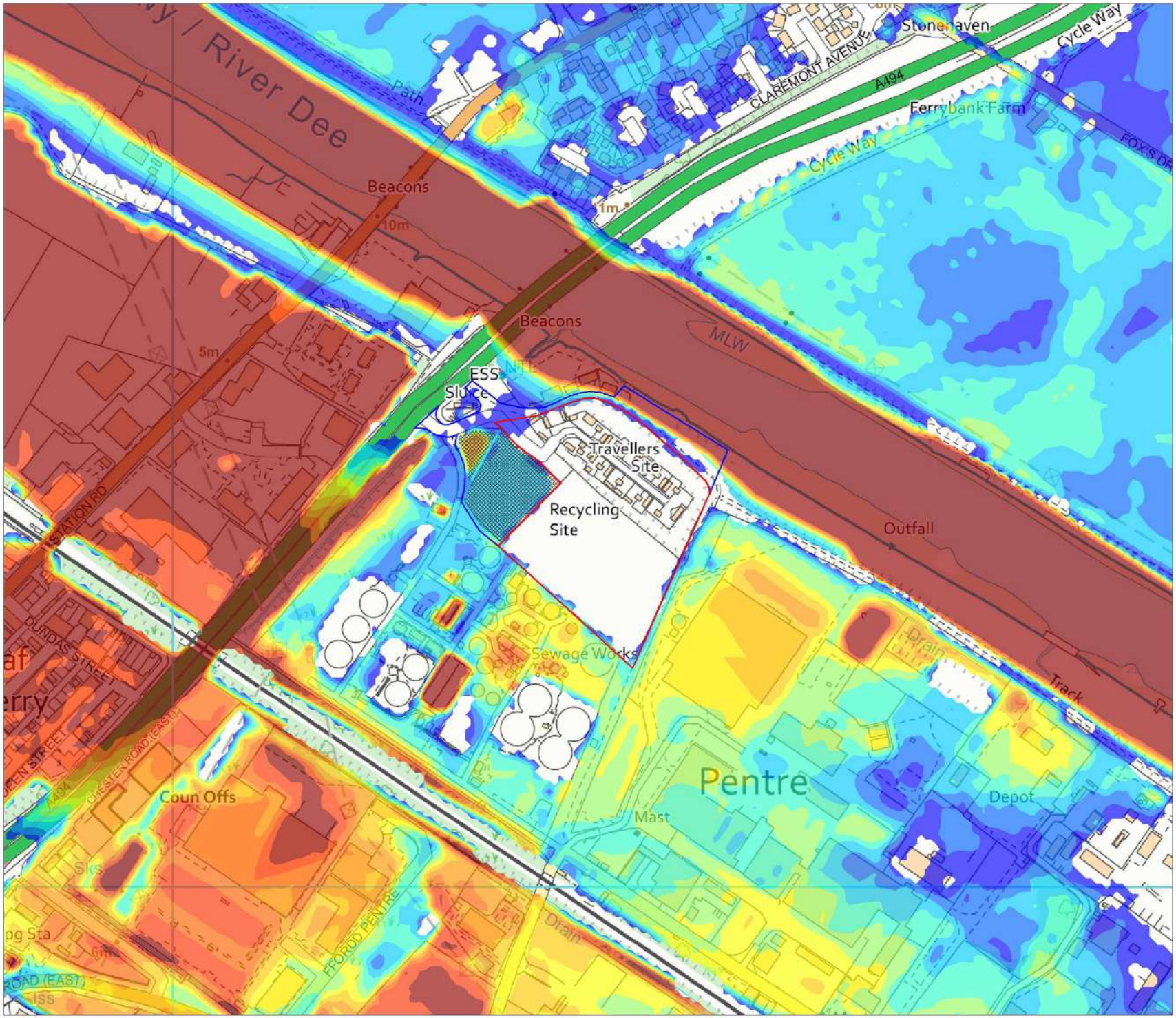
Map Orientation: N W E S

Scale: 0 50 100 metres

Drawn:	Checked:	Date:
AE	JA	26 November 2020

Drawing No: 4535_011_T0200_2120

Rev: A



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Depth (metres)

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Drawing Title: **Max Flood Depths; Breach Scenario (Proposed) 1:1,000 (2120) annual probability**

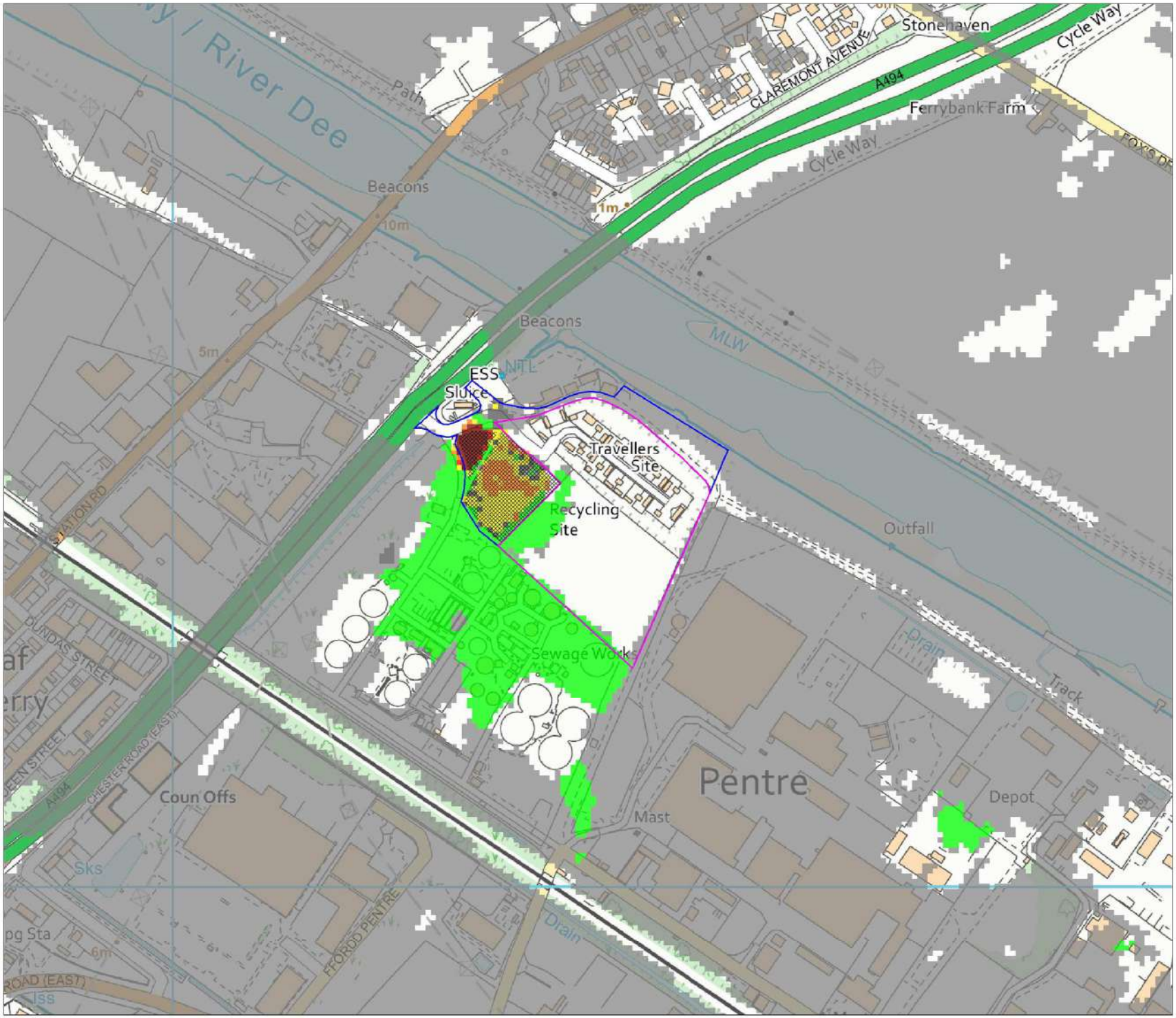
Map Orientation: N W E S

Scale: 0 50 100 metres

Drawn:	Checked:	Date:
AE	JA	26 November 2020

Drawing No:	Rev:
4535_011_T1000_2120	A

APPENDIX F:	Model Plot – Tidal Breach (Comparison)



Notes:

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KEY:

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- Reprofiled land (Flood Storage)

Change in flood depths

- Decrease (>5 mm)
- No change (+/- 5 mm)
- Increase (5 to 30 mm)
- Increase (30 to 75 mm)
- Increase (75 to 150 mm)
- Increase (150 to 300 mm)
- Increase (>300 mm)

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Project Title: **Riverside, Queensferry**

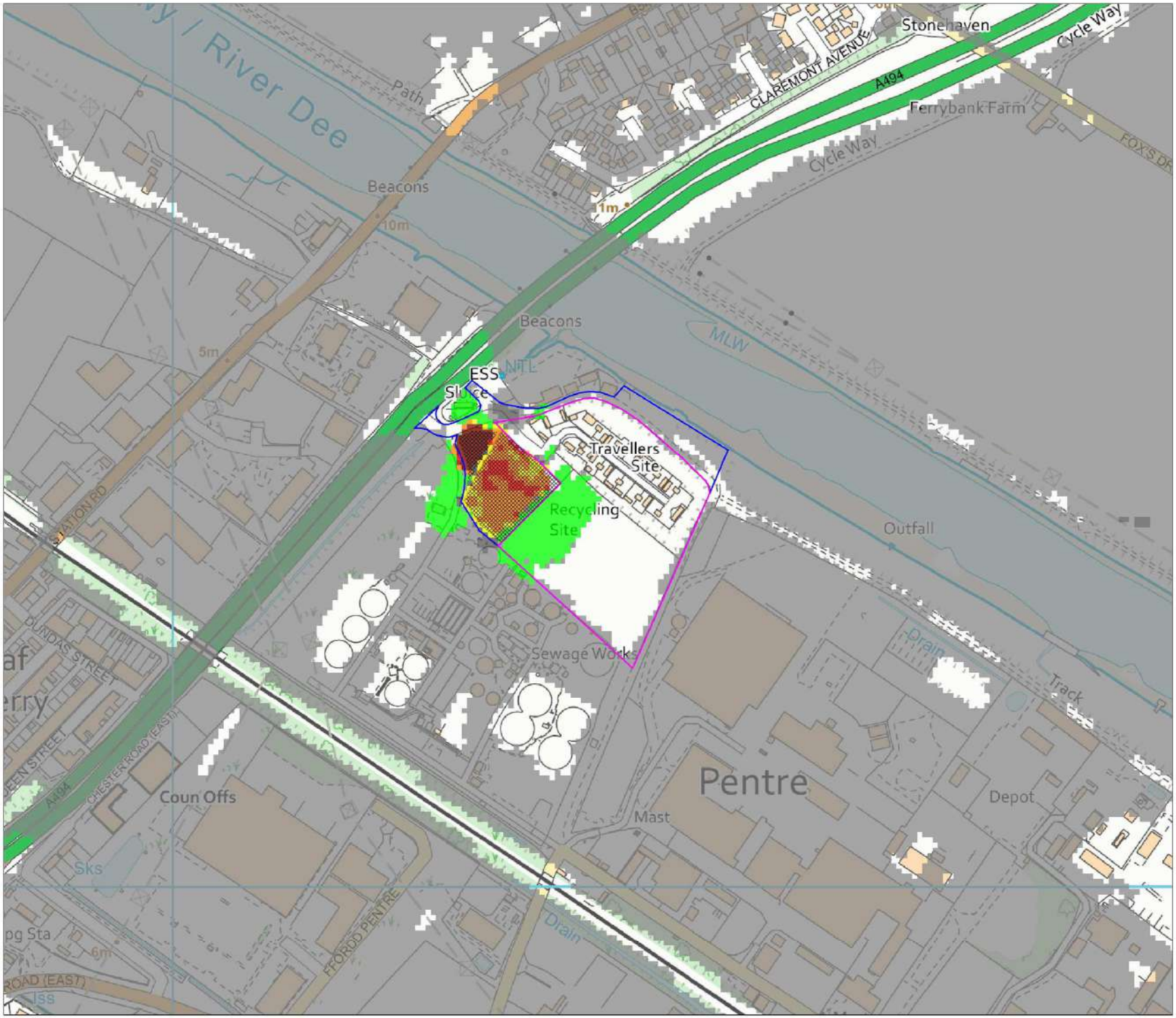
Drawing Title: **Comparison Plot; Breach Scenario 1:200 (2120) annual probability**

Map Orientation: N W E S

Scale: 0 50 100 metres

Drawn:	Checked:	Date:
AE	JA	26 November 2020

Drawing No:	Rev:
4535_011-007_T0200_2120	A



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Change in flood depths

- Decrease (>5 mm)
- No change (+/- 5 mm)
- Increase (5 to 30 mm)
- Increase (30 to 75 mm)
- Increase (75 to 150 mm)
- Increase (150 to 300 mm)
- Increase (>300 mm)

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Map Orientation: N W E S

Scale: 0 50 100 metres

Drawn:	Checked:	Date:
AE	JA	26 November 2020

Drawing No:	Rev:
4535_011-007_T1000_2120	A

APPENDIX G:	Greenfield Runoff Rates

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.450
Area (ha)	1.000	Urban	0.000
SAAR (mm)	789	Region Number	Region 9

Results l/s

QBAR Rural	5.1
QBAR Urban	5.1
Q100 years	11.0
Q1 year	4.4
Q30 years	8.9
Q100 years	11.0

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APPENDIX H:	Peak Runoff Rate from Existing Site

The peak discharge rates of surface water runoff from the impermeable areas at the site have been calculated based on the Modified Rational Method[12].

The following parameters have been obtained from the maps in Volume 3 of the Wallingford Procedure:

M5-60 minute rainfall depth:		18 mm
Ratio of M5-60 to M5-2 day rainfall:		0.362
Average Annual Rainfall:		789 mm
Winter Rain Acceptance Potential/ Soil Type :	0.45/4	
The Urban Catchment Wetness Index (UCWI) value:	83	

The time for runoff to flow to the discharge point has been set at 15 minutes.

A rainfall estimation calculation has been carried out to convert the M5-60 minute rainfall to the 15-minute duration rainfall for the 1:1, 1:2 (QBAR), 1:30 and 1:100 annual probability rainfall events. The calculated rainfall intensities for these events are 27.0, 35.0, 66.1 and 85.0 mm/hr respectively.

The flow rate as given by the Modified Rational Method is:

$$\mathbf{Q=2.78 \times C_v \times C_r \times \text{rainfall intensity} \times \text{impermeable area}}$$

where:

C_v is the volumetric runoff coefficient = P_r/PIMP = 0.79
where P_r is Percentage Runoff and PIMP is Percentage Impermeable Area
C_r is the routing coefficient = 1.3
Impermeable Area = 2.34 ha

The peak discharges of surface runoff from impermeable areas of the existing site are shown in the table below:

Peak Runoff Rate

Annual probability of rainfall event	Peak discharge for 2.34 ha impermeable area (l/s)
1:1	182.7
QBAR	236.4
1:30	446.9
1:100	574.8

[12] The Wallingford Procedure, Volume 4, 1981

APPENDIX I:	Surface Water Attenuation - Storage Volume Calculation

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	0.439	0.439	22.9	622.6	O K
30 min Summer	0.569	0.569	25.9	822.5	O K
60 min Summer	0.696	0.696	28.5	1025.1	O K
120 min Summer	0.809	0.809	30.6	1210.4	O K
180 min Summer	0.859	0.859	31.5	1292.5	O K
240 min Summer	0.880	0.880	31.9	1329.5	O K
360 min Summer	0.888	0.888	32.0	1343.0	O K
480 min Summer	0.890	0.890	32.1	1345.8	O K
600 min Summer	0.887	0.887	32.0	1340.3	O K
720 min Summer	0.880	0.880	31.9	1329.3	O K
960 min Summer	0.861	0.861	31.5	1296.3	O K
1440 min Summer	0.811	0.811	30.7	1213.0	O K
2160 min Summer	0.733	0.733	29.2	1085.0	O K
2880 min Summer	0.662	0.662	27.8	969.6	O K
4320 min Summer	0.543	0.543	25.3	782.4	O K
5760 min Summer	0.451	0.451	23.2	640.3	O K
7200 min Summer	0.377	0.377	21.3	530.4	O K
8640 min Summer	0.318	0.318	19.6	443.2	O K
10080 min Summer	0.261	0.261	18.8	361.6	O K
15 min Winter	0.488	0.488	24.1	698.1	O K
30 min Winter	0.633	0.633	27.2	923.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	110.355	0.0	607.1	19
30 min Summer	73.815	0.0	817.9	33
60 min Summer	47.182	0.0	1074.8	62
120 min Summer	29.193	0.0	1332.4	122
180 min Summer	21.758	0.0	1490.7	182
240 min Summer	17.557	0.0	1604.4	240
360 min Summer	12.862	0.0	1763.6	314
480 min Summer	10.321	0.0	1887.1	376
600 min Summer	8.694	0.0	1986.8	440
720 min Summer	7.553	0.0	2071.0	506
960 min Summer	6.044	0.0	2208.6	644
1440 min Summer	4.407	0.0	2410.9	922
2160 min Summer	3.207	0.0	2657.5	1320
2880 min Summer	2.557	0.0	2823.8	1728
4320 min Summer	1.855	0.0	3064.7	2468
5760 min Summer	1.475	0.0	3265.1	3224
7200 min Summer	1.234	0.0	3413.4	3960
8640 min Summer	1.066	0.0	3536.3	4672
10080 min Summer	0.942	0.0	3637.7	5352
15 min Winter	110.355	0.0	682.1	18
30 min Winter	73.815	0.0	917.9	33

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	0.775	0.775	30.0	1152.9	O K
120 min Winter	0.902	0.902	32.3	1366.0	O K
180 min Winter	0.959	0.959	33.2	1464.6	O K
240 min Winter	0.987	0.987	33.7	1513.0	O K
360 min Winter	1.000	1.000	33.9	1536.4	O K
480 min Winter	0.996	0.996	33.8	1528.2	O K
600 min Winter	0.991	0.991	33.7	1518.9	O K
720 min Winter	0.980	0.980	33.6	1501.0	O K
960 min Winter	0.950	0.950	33.1	1449.2	O K
1440 min Winter	0.876	0.876	31.8	1322.2	O K
2160 min Winter	0.763	0.763	29.8	1132.9	O K
2880 min Winter	0.662	0.662	27.8	969.1	O K
4320 min Winter	0.501	0.501	24.4	716.8	O K
5760 min Winter	0.382	0.382	21.4	537.9	O K
7200 min Winter	0.287	0.287	18.8	399.2	O K
8640 min Winter	0.204	0.204	18.8	279.4	O K
10080 min Winter	0.181	0.181	16.7	248.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	47.182	0.0	1205.1	62
120 min Winter	29.193	0.0	1493.6	120
180 min Winter	21.758	0.0	1670.9	178
240 min Winter	17.557	0.0	1798.2	234
360 min Winter	12.862	0.0	1976.5	342
480 min Winter	10.321	0.0	2114.7	396
600 min Winter	8.694	0.0	2226.4	466
720 min Winter	7.553	0.0	2320.7	542
960 min Winter	6.044	0.0	2474.6	696
1440 min Winter	4.407	0.0	2700.8	994
2160 min Winter	3.207	0.0	2977.3	1424
2880 min Winter	2.557	0.0	3163.6	1816
4320 min Winter	1.855	0.0	3435.3	2596
5760 min Winter	1.475	0.0	3657.7	3344
7200 min Winter	1.234	0.0	3823.9	4112
8640 min Winter	1.066	0.0	3962.2	4504
10080 min Winter	0.942	0.0	4077.6	5248

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.362	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 3.080

Time (mins) From:	To:	Area (ha)
0	4	3.080

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Model Details

Storage is Online Cover Level (m) 1.300

Tank or Pond Structure

Invert Level (m) 0.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1332.0	1.000	1748.4	1.300	1884.4

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SCU-0185-3390-1000-3390
Design Head (m)	1.000
Design Flow (l/s)	33.9
Flush-Flo™	Calculated
Objective	Linear discharge profile
Application	Surface
Sump Available	Yes
Diameter (mm)	185
Invert Level (m)	0.000
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	33.9
Flush-Flo™	0.219	18.8
Kick-Flo®	0.276	18.4
Mean Flow over Head Range	-	22.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.1	1.200	37.0	3.000	57.6	7.000	87.0
0.200	18.4	1.400	39.9	3.500	62.1	7.500	90.0
0.300	19.1	1.600	42.5	4.000	66.2	8.000	92.9
0.400	21.9	1.800	45.0	4.500	70.1	8.500	95.7
0.500	24.3	2.000	47.3	5.000	73.8	9.000	98.4
0.600	26.5	2.200	49.6	5.500	77.3	9.500	101.0
0.800	30.5	2.400	51.7	6.000	80.7		
1.000	33.9	2.600	53.7	6.500	83.9		

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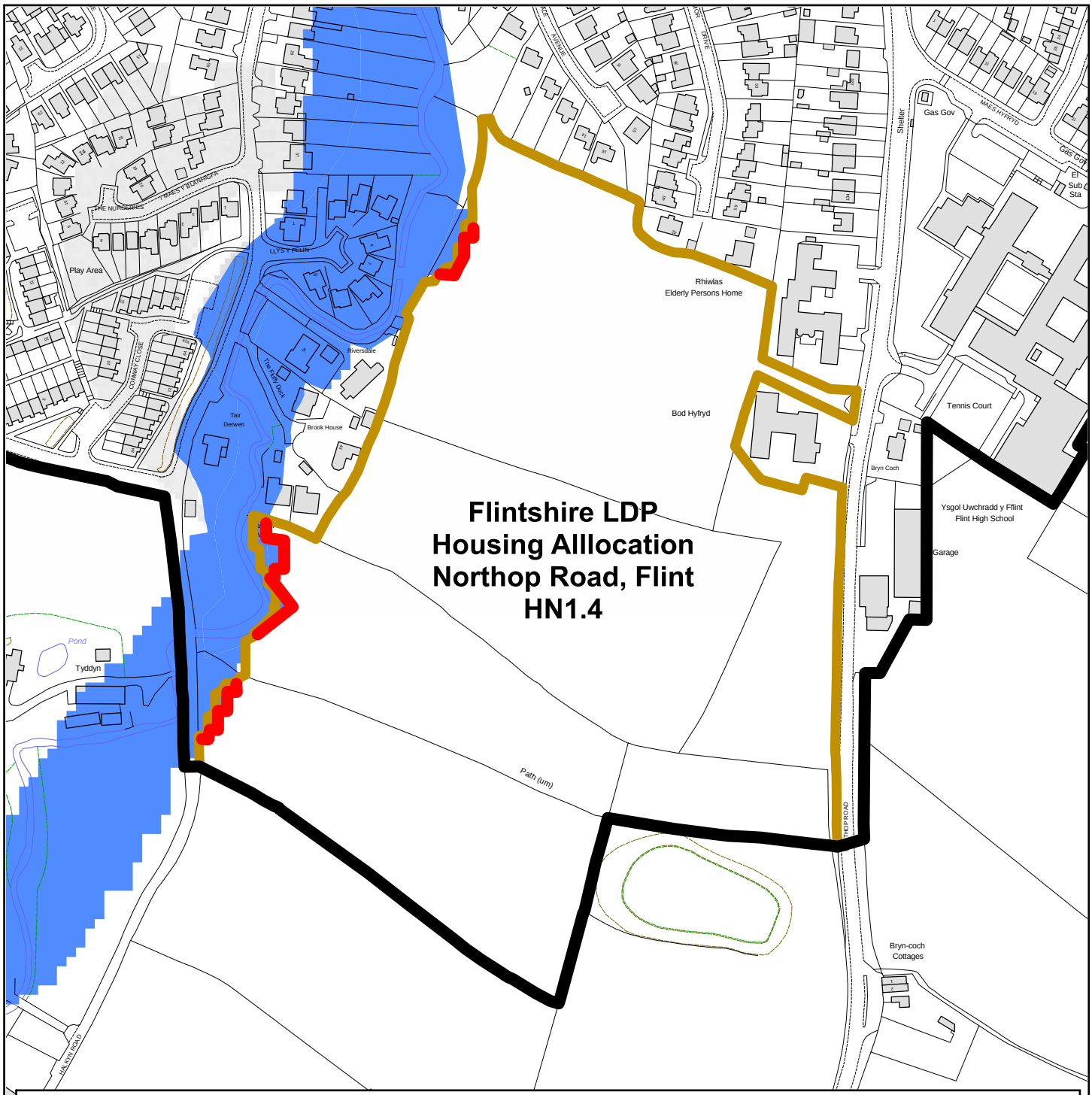
Appendix 6



Boundary alteration to LDP Housing Allocation HN1.4 (Northop Road, Flint) due to correction of adjacent TAN15 C2 Flood risk extent

Legend

- Correction to Housing Allocation boundary to follow corrected TAN 15 C2 Flood risk extent
- Current LDP Housing Allocation extent
- Correct extent of TAN 15 Flood risk Zone C2
- LDP Settlement boundary

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Planning, Environment & Economy,
Flintshire County Council,
County Hall, Mold,
Flintshire, CH7 6NF.
Chief Officer: Mr Andrew Farrow

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