

Appendix D

Model Build Log

No	Name	type	Notes	File location
1	V_RC6472_IPSEN_Final_V3.dat	.dat	Final version of the 1D model	rc6400s\rc6472-ipsen-biopharm-fca\4-Technical\Calculations\Water\IPSEN_1D\Build
2	V_RC6472_IPSEN_Final_V5_Inflow.dat	.dat	1D model with lateral inflow Worst Case scenario	rc6400s\rc6472-ipsen-biopharm-fca\4-Technical\Calculations\Water\IPSEN_1D\Build
3	V_RC6472_IPSEN_Final_V6_Inflow.dat	.dat	1D model with lateral inflow Worst Case scenario	rc6400s\rc6472-ipsen-biopharm-fca\4-Technical\Calculations\Water\IPSEN_1D\Build
Sensitivity analysis			Notes	File location
4	V_RC6472_IPSEN_Final_V3+Manning.dat	.dat	plus 30% Manning values at 1D model	rc6400s\rc6472-ipsen-biopharm-fca\4-Technical\Calculations\Water\IPSEN_1D\Build
5	V_RC6472_IPSEN_Final_V3-Manning.dat	.dat	minus 30% Manning values at 1D model	rc6400s\rc6472-ipsen-biopharm-fca\4-Technical\Calculations\Water\IPSEN_1D\Build
Blockage scenarios			Notes	File location
6	V_RC6472_IPSEN_Final_V3_30Blk.dat	.dat	Assumed 30% blockage scenario ~ 628mm D	rc6400s\rc6472-ipsen-biopharm-fca\4-Technical\Calculations\Water\IPSEN_1D\Build
7	V_RC6472_IPSEN_Final_V3_60Blk.dat	.dat	Assumed 60% blockage scenario ~ 475mm D	rc6400s\rc6472-ipsen-biopharm-fca\4-Technical\Calculations\Water\IPSEN_1D\Build
8	V_RC6472_IPSEN_Final_V3_90Blk.dat	.dat	Assumed 90% blockage scenario ~ 220mm D	rc6400s\rc6472-ipsen-biopharm-fca\4-Technical\Calculations\Water\IPSEN_1D\Build
ISIS Event File			Notes	File location
9	IPSEN_20yr_unblocked.ief	.ief	20 yr return period	MODEL_IPSEN_Final\IPSEN_1D\Run
10	IPSEN_100yr_unblocked.ief	.ief	100 yr return period	MODEL_IPSEN_Final\IPSEN_1D\Run
11	IPSEN_100yr_plusinflow.ief	.ief	100 yr return period plus inflow in pipes	MODEL_IPSEN_Final\IPSEN_1D\Run
12	IPSEN_100yr_plusinflowWC.ief	.ief	100 yr return period plus inflow in pipes WC	MODEL_IPSEN_Final\IPSEN_1D\Run
13	IPSEN_100yr+30CC_unblocked.ief	.ief	100 + CC (30%) yr return period	MODEL_IPSEN_Final\IPSEN_1D\Run
14	IPSEN_100yr+75CC_unblocked.ief	.ief	100 + CC (75%) yr return period	MODEL_IPSEN_Final\IPSEN_1D\Run
15	IPSEN_1000Yr_unblocked.ief	.ief	1000 yr Morris return period	MODEL_IPSEN_Final\IPSEN_1D\Run
16	IPSEN_100yr_30blockage.ief	.ief	100 yr return period 30% blockage	MODEL_IPSEN_Final\IPSEN_1D\Run
17	IPSEN_100yr_60blockage.ief	.ief	100 yr return period 60% blockage	MODEL_IPSEN_Final\IPSEN_1D\Run
18	IPSEN_100yr_90blockage.ief	.ief	100 yr return period 90% blockage	MODEL_IPSEN_Final\IPSEN_1D\Run
19	IPSEN_1000yr_30blockage.ief	.ief	1000 yr return period 30% blockage	MODEL_IPSEN_Final\IPSEN_1D\Run
20	IPSEN_1000yr_60blockage.ief	.ief	1000 yr return period 60% blockage	MODEL_IPSEN_Final\IPSEN_1D\Run
21	IPSEN_1000yr_90blockage.ief	.ief	1000 yr return period 90% blockage	MODEL_IPSEN_Final\IPSEN_1D\Run
ISIS Event Data			Notes	File location
22	MinusBoundary.ied	.ied	Sensitivity analysis -20% gradient	MODEL_IPSEN_Final\IPSEN_1D\Flows
23	PlusBoundary.ied	.ied	Sensitivity analysis +20% gradient	MODEL_IPSEN_Final\IPSEN_1D\Flows
24	Tr20.ied	.ied	20 yr return period event	MODEL_IPSEN_Final\IPSEN_1D\Flows
25	Tr100.ied	.ied	100 yr return period event	MODEL_IPSEN_Final\IPSEN_1D\Flows
26	Tr100Plusinflow.ied	.ied	100 yr return period event plus inflow at culvert	MODEL_IPSEN_Final\IPSEN_1D\Flows
27	Tr100PlusinflowWC.ied	.ied	100 yr return period event plus inflow at culvert Worst Case	MODEL_IPSEN_Final\IPSEN_1D\Flows
28	Tr100+20sa.ied	.ied	Sensitivity analysis 100 yr return period +20%	MODEL_IPSEN_Final\IPSEN_1D\Flows
29	Tr100+CC.ied	.ied	Sensitivity analysis 100 yr return period +100%	MODEL_IPSEN_Final\IPSEN_1D\Flows
30	Tr100-20sa.ied	.ied	Sensitivity analysis 100 yr return period -20%	MODEL_IPSEN_Final\IPSEN_1D\Flows
31	Tr1000Morris.ied	.ied	1000Morris yr return period event	MODEL_IPSEN_Final\IPSEN_1D\Flows
Sensitivity Analysis			Notes	File location
32	IPSEN_100yr_+20SA.ief	.ief	Plus 20% flow CC	MODEL_IPSEN_Final\IPSEN_1D\Run
33	IPSEN_100yr_-20SA.ief	.ief	Minus 20% flow CC	MODEL_IPSEN_Final\IPSEN_1D\Run
34	IPSEN_100yr_MinManning.ief	.ief	Plus 20% Manning	MODEL_IPSEN_Final\IPSEN_1D\Run
35	IPSEN_100yr_PlusManning.ief	.ief	Minus 20% Manning	MODEL_IPSEN_Final\IPSEN_1D\Run
36	IPSEN_100yr_MinusBoundary.ief	.ief	Minus 20% gradient	MODEL_IPSEN_Final\IPSEN_1D\Run
37	IPSEN_100yr_PlusBoundary.ief	.ief	Plus 20% gradient	MODEL_IPSEN_Final\IPSEN_1D\Run

Tuflow Control Files

	Name	File	Location	Note
1	<i>RC6472_171005_IPSEN_~s~_~e~.tcf</i>	<i>.tcf</i>	MODEL_IPSEN_Final_V6\IPSEN_2D\Tuflow\runs	Tuflow Control File, projection, events, output format, stime steps
2	<i>RC6472_Event.tef</i>	<i>.tef</i>	MODEL_IPSEN_Final_V6\IPSEN_2D\Tuflow\runs	Tuflow Event File, where every event is called
3	<i>RC6472_171005_IPSEN.tgc</i>	<i>.tgc</i>	MODEL_IPSEN_Final_V6\IPSEN_2D\Tuflow\model	Tuflow Geometry Control, Load the DTM, cell size, active/inactive cells
4	<i>RC6472_IPSEN.tbc</i>	<i>.tbc</i>	MODEL_IPSEN_Final_V6\IPSEN_2D\Tuflow\model	Tuflow Boundary Control, gradient values & Boundary conditions DS
5	<i>RC6472_IPSEN_Mannings.tmf</i>	<i>.tmf</i>	MODEL_IPSEN_Final_V6\IPSEN_2D\Tuflow\model	Tuflow Material File, Manning value for each feature

Shape files

No	Name	Content	Location
1	Projection.shp	Input/Output projection shp British National Grid (EPSG 27700)	MODEL_IPSEN_Final\IPSEN_2D\Tuflow\model\QGIS\Projection.shp
2	2d_mat_IPSEN_R.shp	materials, manning digitized by hand	MODEL_IPSEN_Final\IPSEN_2D\Tuflow\model\QGIS\2d_mat_IPSEN_R.shp
3	ISIS_network_FM_L.shp	FloodModeller network Cross sections	MODEL_IPSEN_Final\IPSEN_2D\Tuflow\model\QGIS\ISIS_network_FM_L.shp
4	ISIS_nodes_RC62472_P.shp	Nodes from FloodModeller	MODEL_IPSEN_Final\IPSEN_2D\Tuflow\model\QGIS\ISIS_nodes_RC62472_P.shp
5	2d_zln_RC62472_BankTop_L.shx	2D bank Left and Right Banks (boundary active area)	MODEL_IPSEN_Final\IPSEN_2D\Tuflow\model\QGIS\2d_zln_RC62472_BankTop_L.shx
6	2d_zln_RC62472_BankTop_P.shx	2D bank Left and Right bank points (joining points)	MODEL_IPSEN_Final\IPSEN_2D\Tuflow\model\QGIS\2d_zln_RC62472_BankTop_P.shx
7	2D_Code_Inactive_RC62472_R.shp	2D inactive area code 0 means inactive	MODEL_IPSEN_Final\IPSEN_2D\Tuflow\model\QGIS\2D_Code_Inactive_RC62472_R.shp
8	2D_Code_active_RC62472_R.shp	2D active area code 1 means active	MODEL_IPSEN_Final\IPSEN_2D\Tuflow\model\QGIS\2D_Code_active_RC62472_R.shp
9	sj3750_dtm_1m.asc	LiDAR topography of region (1m)	MODEL_IPSEN_Final\IPSEN_2D\Tuflow\model\DTM\sj3750_dtm_1m.asc
10	2d_bc_HQ_RC6472_L.shp	Boundary condition downstream current condition	MODEL_IPSEN_Final\IPSEN_2D\Tuflow\model\QGIS\2d_bc_HQ_RC6472_L.shp
11	2d_bc_HQ_RC6472_minus20_L.shp	Boundary condition downstream-sensitivity analysis 20% plus gradient	MODEL_IPSEN_Final\IPSEN_2D\Tuflow\model\QGIS\2d_bc_HQ_RC6472_minus20_L.shp
12	2d_bc_HQ_RC6472_plus20_L.shp	Boundary condition downstream-sensitivity analysis 20% minus gradient	MODEL_IPSEN_Final\IPSEN_2D\Tuflow\model\QGIS\2d_bc_HQ_RC6472_plus20_L.shp
13	2d_bc_hx_RC62472_L.shp	2D cross section connection CN or bank boundary HX	MODEL_IPSEN_Final\IPSEN_2D\Tuflow\model\QGIS\2d_bc_hx_RC62472_L.shp
14	2d_loc_RC62472_L.shp	Boundary condition downstream current condition	MODEL_IPSEN_Final\IPSEN_2D\Tuflow\model\QGIS\2d_loc_RC62472_L.shp
15	2d_zln_RC62472_FFL_R.shp	Features from FFL from survey	MODEL_IPSEN_Final_V3\IPSEN_2D\Tuflow\model\QGIS\2d_zln_RC62472_FFL_R.shp
16	2d_zln_RC62472_contour_L.shp	Contour lines from Topographical survey	MODEL_IPSEN_Final_V3\IPSEN_2D\Tuflow\model\QGIS\2d_zln_RC62472_contour_L.shp
17	2d_zln_RC62472_feature_L.shp	Features, banks, walls from topographical survey	MODEL_IPSEN_Final_V3\IPSEN_2D\Tuflow\model\QGIS\2d_zln_RC62472_feature_L.shp
18	DataSurvey.shp	Spot points and FFL	MODEL_IPSEN_Final_V2\IPSEN_2D\Tuflow\model\QGIS\DataSurvey.shp
19	contoursTS.shp	Contours from Topo survey	MODEL_IPSEN_Final_V2\IPSEN_2D\Tuflow\model\QGIS\contoursTS.shp

Event File

				.ied			
Event	.dat	.ief	in	peak flow	out (2d)	Run?	
1	IPSEN_20yr_unblocked.ief	V_RC6472_IPSEN_Final_V3.dat	IPSEN_20yr_unblocked.ief	Q20	0.147	Exist	Y
2	IPSEN_100yr_unblocked.ief		IPSEN_100yr_unblocked.ief	Q100	0.207	Exist	Y
3	IPSEN_100yr_plusinflow.ief	V_RC6472_IPSEN_Final_V5_Inflow.dat	IPSEN_100yr_plusinflow.ief	Q100	0.207	Exist	Y
4	IPSEN_100yr_plusinflowWC.ief	V_RC6472_IPSEN_Final_V6_Inflow.dat	IPSEN_100yr_plusinflowWC.ief	Q100	0.207	Exist	Y
5	IPSEN_100yr+30CC_unblocked.ief	V_RC6472_IPSEN_Final_V3.dat	IPSEN_100yr+30CC_unblocked.ief	Q100+30CC	0.269	Exist	Y
6	IPSEN_100yr+75CC_unblocked.ief		IPSEN_100yr+75CC_unblocked.ief	Q100+75CC	0.362	Exist	Y
7	IPSEN_1000Yr_unblocked.ief		IPSEN_1000Yr_unblocked.ief	Q1000 Morris	0.412	Exist	Y
8	IPSEN_100yr_30blockage.ief	V_RC6472_IPSEN_Final_V3_30Blk.dat	IPSEN_100yr_30blockage.ief	Q100	0.207	Ex30Blk	Y
9	IPSEN_100yr_60blockage.ief	V_RC6472_IPSEN_Final_V3_60Blk.dat	IPSEN_100yr_60blockage.ief	Q100	0.207	Ex60Blk	Y
10	IPSEN_100yr_90blockage.ief	V_RC6472_IPSEN_Final_V3_90Blk.dat	IPSEN_100yr_90blockage.ief	Q100	0.207	Ex90Blk	N
11	IPSEN_1000yr_30blockage.ief	V_RC6472_IPSEN_Final_V3_30Blk.dat	IPSEN_1000yr_30blockage.ief	Q1000 Morris	0.412	Ex30Blk	Y
12	IPSEN_1000yr_60blockage.ief	V_RC6472_IPSEN_Final_V3_60Blk.dat	IPSEN_1000yr_60blockage.ief	Q1000 Morris	0.412	Ex60Blk	Y
13	IPSEN_1000yr_90blockage.ief	V_RC6472_IPSEN_Final_V3_90Blk.dat	IPSEN_1000yr_90blockage.ief	Q1000 Morris	0.412	Ex90Blk	N
14	IPSEN_100yr_+20SA.ief	V_RC6472_IPSEN_Final_V3.dat	IPSEN_100yr_+20SA.ief	Q100+20%	0.248	Exist	Y
15	IPSEN_100yr_-20SA.ief	V_RC6472_IPSEN_Final_V3.dat	IPSEN_100yr_-20SA.ief	Q100-20%	0.248	Exist	Y
16	IPSEN_100yr_MinManning.ief	V_RC6472_IPSEN_Final_V3-Manning.dat	IPSEN_100yr_MinManning.ief	Q100	0.207	Exist	Y
17	IPSEN_100yr_PlusManning.ief	V_RC6472_IPSEN_Final_V3+Manning.dat	IPSEN_100yr_PlusManning.ief	Q100	0.207	Exist	Y
18	IPSEN_100yr_MinusBoundary.ief	V_RC6472_IPSEN_Final_V3.dat	IPSEN_100yr_MinusBoundary.ief	Q100	0.207	Exist	Y
19	IPSEN_100yr_PlusBoundary.ief	V_RC6472_IPSEN_Final_V3.dat	IPSEN_100yr_PlusBoundary.ief	Q100	0.207	Exist	Y

Appendix E

Flood Maps



Legend

Flood Depth (m)

0.00m
0.05m
0.10m
0.15m
0.20m
0.25m
0.30m
0.35m
0.40m
0.45m
0.50m
Existing Pond High Water Level

**OPUS**

Wrexham Office
+44 1978 368100

Opus House, Yale Business
Village, Wrexham Tech.
Park, Wrexham LL13 7YL

AO	VM	MAW	25.10.17
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V-R6472.01	1:1000 @ A3
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IPSEN BIOPHARM
FLOOD CONSEQUENCES
ASSESSMENT

5% AEP EVENT

V/R6472/01/G	01	A
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Legend

Flood Depth (m)

0.00m
0.05m
0.10m
0.15m
0.20m
0.25m
0.30m
0.35m
0.40m
0.45m
0.50m
Existing Pond High Water Level

**OPUS**

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AO	VM	MAW	25.10.17
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V-R6472.02	1:1000 @ A3
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IPSEN BIOPHARM
FLOOD CONSEQUENCES
ASSESSMENT

1% AEP EVENT

V/R6472/02/G	02	A
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Legend

Flood Depth (m)

0.00m
0.05m
0.10m
0.15m
0.20m
0.25m
0.30m
0.35m
0.40m
0.45m
0.50m
Existing Pond High Water Level

**OPUS**

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Park, Wrexham LL13 7YL

AO	VM	MAW	25.10.17
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V-R6472.03	1:1000 @ A3
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IPSEN BIOPHARM FLOOD CONSEQUENCES ASSESSMENT
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1% AEP + CC

V/R6472/03/G	03	A
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Legend

Flood Depth (m)

0.00m
0.05m
0.10m
0.15m
0.20m
0.25m
0.30m
0.35m
0.40m
0.45m
0.50m
Existing Pond High Water Level

**OPUS**

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AO	VM	MAW	25.10.17
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V-R6472.04	1:1000 @ A3
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IPSEN BIOPHARM
FLOOD CONSEQUENCES
ASSESSMENT

0.1% AEP EVENT

V/R6472/04/G	04	A
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Legend

Flood Depth (m)

0.00m
0.05m
0.10m
0.15m
0.20m
0.25m
0.30m
0.35m
0.40m
0.45m
0.50m
Existing Pond High Water Level

**OPUS**

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AO	VM	MAW	25.10.17
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V-R6472.05	1:1000 @ A3
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IPSEN BIOPHARM
FLOOD CONSEQUENCES
ASSESSMENT

1% AEP EVENT WITH SURFACE WATER
DRAINAGE- INFLOW2

V/R6472/05/G	09	A
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