

5 Potential Growth Area Ranking

A scoring system has been devised which allows each of the PGAs to be ranked against each other. This has been carried out using the following methodology:

- The ranking system was undertaken using a base PDS of 10,000 (NPA) and 1,000 (RPA).
- For NPAs, consideration was given for each of the WWTW options outlined in Section 3.1.2 (Whitlingham WWTW, update existing WWTW, new WWTW) and for RPA consideration was given for the single option (update existing WWTW). A preliminary ranking was undertaken based on approximate cost of:
 - WWTW;
 - Water supply; and
 - Water resources.
- NPA11 (Norwich City) was not included in the ranking because there is only one option for the WWTW which is to treat at Whitlingham WWTW which can take all of the flow. Therefore, upgrading Whitlingham or providing a new WWTW was not relevant.
- A scoring system was assigned for each of the remaining 11 sites (NPA) with 20 points assigned for each position – the least expensive site scoring 220 point through to the most expensive sites scoring 20 points. The same principle was applied to the 8 RPA sites from 160 (least expensive) to 20 (most expensive).
- For each of the three flood risk related traffic lights (flood risk to the site, flood risk from the site, SUDS), a maximum of 20 points were assigned – 20 for green light, 10 for an amber light and 0 for a red light;
- For each of the three environmental related traffic lights (conservation designation, groundwater vulnerability and source protection zone), a maximum of 20 points were assigned – 20 for green light, 10 for an amber light and 0 for a red light;
- The total scores for each of the PGAs were added up and ranked accordingly. If two PGAs were ranked equally then the PGA with the highest environmental scoring was preferred in line with sustainable development.

It is important to note that this ranking system is for water related aspects of the study area only and do not take into account any of the other potential aspects which may feed into the JCS – such as transport, schools etc.

A summary of the ranking are shown in the tables below and the full costing and ranking table shown in Appendix I.

5.1 NPA Option 1: Whitlingham WWTW

5.1.1 Ranking Table

The table below summarises the ranking of the NPAs based on all of the wastewater going to Whitlingham WWTW. Costs for water supply and water resources are included in the total cost provided.

Table 5-1: NPA Option 1 – Whitlingham WWTW

Rank	PGA	Costed Total (£)	Costed Total Points	Traffic Light Points	Total Points
1	NPA8-South West Sector (A11-B1108)	52,200,000	220	70	290
2	NPA10-North West Sector (A1067-NNDR)	53,300,000	180	60	240
3	NPA9-West Sector (River Yare to River Wensum)	53,200,000	200	30	230
4	NPA2-North East Sector (inside NNDR)	54,200,000	160	50	210
5	NPA4-South East Sector (vicinity of Poringland)	54,400,000	140	50	190
6	NPA1-North Sector (North of Airport)	57,900,000	100	80	180
7	NPA5-South Sector (A11-A140 Outside A47)	55,900,000	120	60	180
8	NPA3b-East Sector (outside of NNDR)	58,000,000	80	70	150
9	NPA3a-North East Sector (outside NNDR, vicinity of Rackheath)	59,900,000	60	80	140
10	NPA7-Wymondham	74,200,000	40	80	120
11	NPA6-Long Stratton	80,900,000	20	70	90

5.1.2 Summary

The ranking system shows that the following results:

- Because the option is similar throughout (all wastewater to Whitlingham WWTW) the associated flood risk traffic light and conservation designation light are the same throughout. This leads to the ranking being predominantly influenced by cost (over traffic lights);
- Overall the costs of infrastructure between the PGA are marginal except for Wymondham and Long Stratton, which are situated significantly further from Whitlingham WWTW and Heigham WTW;
- The proximity of NPA 8 (South West Sector), NPA 10 (North West Sector) and NPA9 (West Sector) to Heigham WTW means that water supply and water resources costs lower the overall costs of infrastructure;
- The proximity of NPA 2 (North East Sector) to Whitlingham WWTW and to Heigham WTW leads to the reduction in infrastructure costs;

5.2 NPA Option 2: Existing WWTW

5.2.1 Ranking Table

The table below summarises the ranking of the NPAs based on the wastewater being treated at the existing WWTW, which would require the existing headroom to be maximised and then upgrading of the WWTW thereafter. As with ranking option 1, costs for water supply and water resources are included in the total cost provided.

Table 5-2: NPA Option 2 - Existing WWTW

Rank	PGA	Costed Total (£)	Costed Total Points	Traffic Light Points	Total Points
1	NPA8-South West Sector (A11-B1108)	68,000,000	220	80	300
2	NPA1-North Sector (North of Airport)	72,400,000	160	90	250
3	NPA2-North East Sector (inside NNDR)	70,000,000	180	60	240
4	NPA9-West Sector (River Yare to River Wensum)	69,600,000	200	40	240
5	NPA5-South Sector (A11-A140 Outside A47)	72,500,000	140	70	210
6	NPA7-Wymondham	73,940,000	100	90	190
7	NPA10-North West Sector (A1067-NNDR)	73,100,000	120	70	190
8	NPA3a-North East Sector (outside NNDR, vicinity of Rackheath)	78,300,000	60	90	150
9	NPA4-South East Sector (vicinity of Poringland)	76,100,000	80	60	140
10	NPA3b-East Sector (outside of NNDR)	80,900,000	40	80	120
11	NPA6-Long Stratton	86,000,000	20	80	100

5.2.2 Summary

The ranking system shows that the following results:

- The costs of providing infrastructure are reasonably similar, except for
 - NPA6 (Long Stratton) which has excessively high connection costs to Thorpe St Andrew and Colney BHs. This is because it is assumed that water is piped from boreholes to Heigham WTW and then back again;
 - NPA3b (East Sector) which is relatively far away from Rackheath WWTW;
- Comparing this option to Option 1 (Whitlingham WWTW) there are no obvious PGAs which would significantly benefit from utilising the existing WWTW. However, overall the average costs for this option are approximately £15M more than using Whitlingham. However, this may not necessarily be true in reality, as the methodology for costing a new WWTW and upgrading a WWTW is the same. **Stage 2b** would seek to clarify this by investigating the processes at each WWTW and providing a more specific cost mechanism.

5.3 NPA Option 3: New WWTW

5.3.1 Ranking Table

The table below summarises the ranking of the NPAs based on the wastewater being treated at a new WWTW.

Table 5-3: NPA Option 3 - New WWTW

Rank	PGA	Costed Total (£)	Costed Total Points	Traffic Light Points	Total Points
1	NPA1-North Sector (North of Airport)	66,600,000	220	90	310
2	NPA2-North East Sector (inside NNDR)	68,000,000	200	60	260
3	NPA10-North West Sector (A1067-NNDR)	68,800,000	160	60	220
4	NPA8-South West Sector (A11-B1108)	69,700,000	140	70	210
5	NPA9-West Sector (River Yare to River Wensum)	68,500,000	180	30	210
6	NPA5-South Sector (A11-A140 Outside A47)	73,500,000	120	70	190
7	NPA3b-East Sector (outside of NNDR)	76,100,000	80	80	160
8	NPA4-South East Sector (vicinity of Poringland)	73,800,000	100	60	160
9	NPA3a-North East Sector (outside NNDR, vicinity of Rackheath)	76,500,000	60	90	150
10	NPA7-Wymondham	79,600,000	40	90	130
11	NPA6-Long Stratton	86,800,000	20	80	100

5.3.2 Summary

The ranking system shows that the following results:

- The cost of providing a new WWTW has been standardised throughout, therefore WWTW capital costs have no influence on this option. The results are based on cost of water supply and water resource as well as traffic lights;
- The infrastructure costs for providing pipelines from the boreholes to Heigham WTW and back to Long Stratton make this the most expensive option;
- The distance from Heigham WTW to Long Stratton and Wymondham increase costs for water resources considerably.

5.4 Combined NPA Ranking

5.4.1 Ranking Table

The table below summarises the combined ranking of the NPAs based on *both* the wastewater being treated at the existing WWTW and at Whitlingham. Option 3 (new WWTW) has not been included as the costs of the providing the WWTW are the same and it is considered that building a new WWTW before utilising existing capacity would not be favourable – see Assumption IV.

Table 5-4: Combined Option 1 (Whitlingham WWTW) and Option 2 (Existing WWTW)

PGA	Points	Rank	Points	Rank	Points	Rank
	NPA Option 1		NPA Option 2		Average	
NPA1-North Sector (North of Airport)	180	6	250	2	215	4
NPA2-North East Sector (inside NNDR)	210	4	240	3	225	3
NPA3a-North East Sector (outside NNDR, vicinity of Rackheath)	140	9	150	8	145	9
NPA3b-East Sector (outside of NNDR)	150	8	120	10	135	10
NPA4-South East Sector (vicinity of Poringland)	190	5	140	9	165	7
NPA5-South Sector (A11-A140 Outside A47)	180	6	210	5	195	6
NPA6-Long Stratton	90	11	100	11	95	11
NPA7-Wymondham	120	10	190	6	155	8
NPA8-South West Sector (A11-B1108)	290	1	300	1	295	1
NPA9-West Sector (River Yare to River Wensum)	230	3	240	3	235	2
NPA10-North West Sector (A1067-NNDR)	240	2	190	6	215	4

5.5.2 Summary

The ranking system shows that the following results:

- The costs range considerably for upgrading the WWTW depending on the headroom available in the existing WWTW;
- The distance from Heigham WTW for the provision of water supply infrastructure as well as the GOGDS influences the cost considerably;

5.5 RPA Option 1: Existing WWTW

5.5.1 Ranking Table

The table below summarises the ranking of the RPAs based on the wastewater being treated at the existing WWTW, which would require the existing headroom to be maximised and then upgrading of the WWTW thereafter

Table 5-5: RPA Option 1 - Existing WWTW

Rank	PGA	Costed Total (£)	Costed Total Points	Traffic Light Points	Total Points
1	RPA1-Reepham	30,140,000	200	60	260
2	RPA3-Wroxham	25,800,000	220	30	250
3	RPA5-Hingham	33,050,000	160	80	240
4	RPA8-Lodden	32,280,000	180	60	240
5	RPA2-Aylsham	33,230,000	140	70	210
6	RPA7-Harleston	42,150,000	100	60	160
7	RPA4-Acle	35,140,000	120	40	160
8	RPA6-Diss	44,130,000	80	40	120

6 Summary

The table below summarises on a site-by-site basis the preferred strategy for growth in the PGA. NPA11 (City) option has not been included in the ranking as it is understood that to progress under all scenarios with up to 14,500 properties.

Table 6-1: Summary per PGA

PGA		Option 1 Ranking (Whitlingham WWTW)	Option 2 Ranking (Existing WWTW)	Comment
NPA1	North Sector (North of Airport)	6	2	This option is the top ranked in terms of traffic lights, and its average position (ranked 6) for Whitlingham is influenced by coasts (which are all
NPA2	North East Sector (inside NNDR)	4	3	This PGA is optional under both scenarios due to its proximity to Whitlingham WWTW and Rackheath WWTW.
NPA3a	North East Sector (outside NNDR, vicinity of Rackheath)	9	8	The costs are relatively high as both options are neither close to Whitlingham WWTW nor Heigham WTW; hence costs of infrastructure are high.
NPA3b	East Sector (outside of NNDR)	8	10	This PGA scores low due to the distance from Heigham WTW in Option 1 and distance from Rackheath WWTW in Option 2.
NPA4	South East Sector (vicinity of Poringland)	5	9	Due to the proximity to Whitlingham WWTW, Option 1 is more favourable, as Poringland WWTW does not have spare capacity.
NPA5	South Sector (A11-A140 Outside A47)	6	5	Both Option 1 and 2 are similarly high ranked, which allows for flexibility in optioneering.
NPA6	Long Stratton	11	11	The distance from Long Stratton to Heigham WTW and the costs associated with providing infrastructure mean that this PGA is ranked low in both options.
NPA7	Wymondham	10	6	It is preferable to utilise the existing capacity at Wymondham WWTW and then direct wastewater to Whitlingham WWTW.
NPA8	South West Sector (A11-B1108)	1	1	This is the top ranked PGA under both options due to the proximity to Heigham WTW and Whitlingham, as well as low flood risk related traffic lights.
NPA9	West Sector (River Yare to River Wensum)	3	3	Both option 1 and 2 are relatively high ranked, which allows for flexibility in optioneering.
NPA10	North West Sector (A1067-NNDR)	2	6	Option 1 is more preferable than option 2 because of relatively high costs to upgrade the existing WWTW.
PGA		Option 1 (Existing WWTW)		Comment
RPA1	Reepham	1		This is ranked top due to its proximity to the existing boreholes, relatively inexpensive for WWTW upgrade and low flood risk.
RPA2	Aylsham	5		This has reasonable costs and high than average flood risk and environmental traffic lights, hence its position.
RPA3	Wroxham	2		This was the significantly the most cost effective in terms of WWTW and infrastructure upgrade but was low scoring in flood risk and environmental traffic lights.
RPA4	Acle	6		This has reasonable costs and poor flood risk and environmental traffic lights, hence its position
RPA5	Hingham	3		This is relatively highly ranked on costs and mid-ranked environmental and flood risk costs hence its overall high ranking.
RPA6	Diss	8		This is the lowest ranked due to the large distance from the boreholes and Heigham WTW and poor environmental scoring.
RPA7	Harleston	6		The costs associated with this are high because of the distance from the boreholes and Heigham WTW and has poor traffic lights
RPA8	Lodden	3		This PGA was relatively inexpensive and had mid-range traffic lights hence its overall position.

7 Scope of Stage 2b

Stage 2b will only consider those sites identified in the Preferred Options of the Joint Core Strategy. These are a number of facets to this sub-stage:

7.1 Refine the Preferred Options

Where necessary, further refinement of the preferred options will be undertaken. This may more detailed costing based on process types and more accurate infrastructure routes; identification of process “bottlenecks” and consultation with the Environment Agency on flood defence options (if appropriate).

7.2 Environment Assessment

7.2.1 Water Framework Directive (WFD)

The new WFD is likely to have significant implications on the development and implementation of development sites going forward. In Stage 2a we have indicated that we will identify what those are and incorporate them into the WCS as one of the first tasks. In Stage 2b, we will ensure that the development parameters meet the criteria, especially in relation to emerging draft water quality standards in watercourses receiving treated wastewater discharge. It is not expected that there will be any significant changes between Stage 2a and 2b; however a more site specific analysis with the preferred options will be undertaken where requirements to meet WFD standards will be undertaken.

7.2.2 Habitat Regulations Assessment (Appropriate Assessment)

Whilst undertaking Stage 1 Scott Wilson carried out the suitable level of appropriate assessment for the WCS. The implications of this were incorporated into the reporting. Building on this, we will undertake an Appropriate Assessment of the Stage 2 WCS to ensure that it informs the JCS Appropriate Assessment. This will include the following actions:

- Assess the impacts of current discharges on sensitive downstream designated sites (such as The Broads SPA) and liaison with Natural England, the Environment Agency and the Broads Authorities undertaken.
- Incorporate any results from the RoC process if available;
- Input into the estimation of the costs of the required improvements to the WWTW process to mitigate against this;
- Investigate the sensitivity of those SSSIs that have been identified as potential constraint on development areas for other reasons, in order to determine to what degree they would actually constrain the WCS;
- Incorporate the Review of Consents results into Stage 2b, to include not only the Study Area, but the Redgrave and Lopham Fens SSSI and Blo' Norton & Thelnetham Fens SSSI, where water resources issues have been identified.
- Determine whether the WCS and its recommendations will have an impact on designated sites.

7.3 Development Management

It is advised that a workshop is held at the start of Stage 2b to ensure that the WCS timeline can be realistically aligned with other timelines such as the AMP5, RSS and JCS processes. A number of facets will be investigated:

7.3.1 Development Phasing

Identification of which sites can be delivered at an early stage will be undertaken to provide the opportunity to progress development options. These will identify which of the sites can be progressed with little or minimal investment.

7.3.2 Timeline Development

A timeline will be developed for each of the preferred options so that forecast spend can be realistically aligned with delivery of the infrastructure required. This will be informed by a series of time constraints which will be determined from liaison with Anglian Water Services, the Environment Agency and the Local Authorities.

7.3.3 Identify S106 / Developer Contribution

Once a cost schedule has been identified for the required infrastructure, the mechanisms to obtain these funds will be identified. A number of sources are possible.

Options for applying costs onto the proposed development such as roof tariffs will be investigated and a system which apportions the development in a justified and rational method will be developed.

Stage 1 identified that it is possible that developers can become involved in the Water Cycle Study. Incentives for developers to invest in the project will be identified and we will attend a meeting with the GNPD to assist in the promotion of this if required.

7.3.4 Developer Checklist

Stage 1 of the WCS identified the need for, and advantages of, a developer checklist. As long as this is made specific to the GNPD study area this will provide the following benefits:

- Provide a concise methodology for construction of the development;
- Allow development within the study area to be regulated;
- Provide developers with a guidance on which to design and develop their properties;
- Reduce the likelihood of objections from the Local Planning Authority and Environment Agency to development;
- Standardised the development guidance so to minimise abortive work and hence promote efficient working in the region;
- Ensure that developments are constructed with incumbent and future best practices in mind, such as work arising from the WFD;
- Ensure that development does not have adverse or negative impacts on the local environment and hence promote sustainable development.

8 References

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