

YORKSHIRE WATER SERVICES LTD
PERIODIC REVIEW 2009
PART B3 – SECTION 9
MAINTAINING SERVICE AND SERVICEABILITY
(MANAGEMENT & GENERAL)

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1. MANAGEMENT & GENERAL INTRODUCTION

1.1. INTRODUCTION

1.1.1. Overview

1. The purpose of this section is to set out the procedures for the preparation of the 2009 Periodic Review for investment requirement in Management and General (M&G) Programme.
2. Investment requirements have been established through detailed surveys of our assets and following guidance from external experts where required. The M&G programme is critical to supporting the continuous flow of service to our customers and maintaining serviceability of our assets.

1.1.2. Asset Management Planning Assessment Process (AMPAP)

3. Following UKWIR guidance with on assessing a company’s degree of maturity with regard to asset management planning, we have provided summary scores at the start of each business plan section. See figure 1 below for B3 section 9 AMPAP score. These scores have been calculated following the detailed procedure described in B3 Section 3.2. We have exercised a high degree of rigour and manpower in our assessments, ensuring correct people in the business have provided the evidence and sufficient Quality Assurance undertaken to ensure robust and accurate scoring.

B3 Section 9	Stakeholder Engagement		Leadership, Policy Management & Strategy	
	People		Processes	Systems
	Data		Analysis	Reporting

Figure 1 - M&G Asset Management Planning Assessment Process Scores

4. Figure 1 above represents the main sub-heading splits as detailed in the information requirements at a summary level, rather than split by Infra or Non-infra.
5. Important points for Ofwat to note when undertaking the AMPAP assessments are:
 - We have consulted with our asset management community when scoring, rather undertaking scoring as a central function

- We assigned a full time employee to manage the process, to ensure consistency of application, internal reporting and assessment
- We provided robust evidence for the scores produced
- We undertook a separate audit with our Reporter on the AMPAP process

1.1.3. Programme

6. The M&G programme is a significant proportion (around 10%) of the capital maintenance expenditure requirements in the Final Business Plan (FBP). M&G comprises the following distinct investment areas to support the needs of the main business;
 - Accommodation
 - Fleet
 - Asbestos remediation
 - Information Technology
 - Research and Development
 - Land Property & Planning
 - Carbon and Biodiversity management
 - Renewable Energy
 - Security
 - Access & Recreation
 - Provisions for PR14

7. Table 1 summarises the changes that have been made from Draft Business Plan (DBP) to FBP in the M&G programme and a brief summary of the reason for this change. A full description of any changes can be seen in the relevant sections of this document.

Investment Area	DBP (£m)	FBP (£m)	Reason for change
Accommodation			
Fleet			
Information Technology			
Research &			
Land, Property & Planning			
Asbestos remediation			
Renewable Energy			
Carbon / Biodiversity Management			
Security			
Access and Recreation			
PR14			

Slight changes due to price base correction

Table 1: M&G summary Expenditure Analysis

8. All our ELSA+ costs in the FBP are adjusted by RPI to an average of the 2007/8 base year prices.
9. It is recommended that this area of the business is aligned, where possible, with the LEADA+ process to ensure a robust investment case for AMP5 and to ensure targeted investment in the delivery of the programme.

1.1.4. Management & General Expenditure Allocation

10. At CIS baseline, Ofwat directed us to put the costs for Hydro renewable plants into the Water service and Combined Heat and Power (CHP) plants into Sewerage service. We have followed this guidance and allocated our costs accordingly (see table4). For all other parts of the programme, the analysis undertaken for the Draft Business Plan (DBP) is still relevant and described below.

11. Analysis has been undertaken for investment identified under the heading of M&G and to determine if a proportional split of 50:50 is appropriate between water and environmental expenditure. This analysis has been undertaken following challenge from SMC during PR09 reviews.
12. Each investment area identified in table 2 below has been challenged to establish how much of the investment can be associated with functionally specific assets, i.e. related to water or environmental activities.

Investment Area	Water service	Sewerage service	M&G Generic	Total
				£(m)
Asbestos				
Biodiversity				
Carbon				
Facilities				
IT				
Land Property & Planning				
PR14				
R&PD				
Renew Energy				
Security				
Vehicles & Plant				
Access and Recreation				
Total				
Percentage Split				

Table 2: Management & General Expenditure Allocation

13. Table 2 shows that 62% of the proposed £189.44m cannot be attributed to a specific function in the business. Where expenditure can be attributed the programme level split is 46.50:53.50 (Water: Sewerage service).
14. This means that in overall terms the ration of M&G allocated to Water and Sewerage is 49.25% to 50.75 % respectively.

1.1.5. Approach to M&G Investment

15. Our approach is to produce an M&G programme from LEADA+ as in the same way as for water and sewerage service investment programmes. This involved additional benefit assessment categories being developed in addition to the existing business risk matrices. This ensures that M&G investment is:

- Evaluated/prioritised in the same way - on the basis of the project effects on service-risk, service-enhancement and/or service-cost.
- Evaluated/prioritised within M&G functions and within the investment programme as a whole.
- Evaluated/prioritised in a way that enables AMP5 delivery as Business As Usual.

16. Table 3 below details each area of investment with regard to data collection and costing:

Leading Edge Asset Decision Analysis+		
Area of investment	Data collection & Risk assessment	Source of costs
Accommodation	Surveys completed by consultants & remedial contractors	External provision
Asbestos	Asset surveys, site prioritisation according to risk	Previously completed contracts
Biodiversity	Business brainstorming workshops, Environmental Advisory Panel (EAP) workshops, challenge sessions	Feasibility studies, similar previous projects, external provision
Carbon / Biodiversity Management	Business brainstorming workshops, EAP workshops, challenge sessions	Feasibility studies, external provision
Fleet	Fleet Management System, full plant audit	Historical data, held on FMS including whole life costs
Information Technology	Team manager estimates, initial purchase price including configuration & deployment	Historical data, existing asset registers & site surveys
Land, Property & Planning	Survey data completed by consultants & remedial contractors, future trend anticipation, feasibility studies	External provision, similar tendered work, feasibility studies
Renewable Energy	Desk study done for Hydro, CHP	External provision
Research & Development	Stakeholder workshops, risk/reward assessment	Historical & statistical data used
Security	Chemical dosing sample data, borehole protection surveys, fencing done by business units, some historical data used	External provision, historical data
PR14		Analysis of completed and forecast costs for those used for PR09

Table: 3 Summary of Approach to M&G Investment and Key Issues

1.1.6. *ELSA+ Optimisation*

17. Within LEADA+ all of the M&G investment areas have been constrained in the programme due to statutory obligations or strategic business decisions. Forcing them through ELSA+ has allowed us to obtain a Net Benefit number for evaluation purposes. Further detail of this approach is provided in section C8. In the feedback documents, Ofwat directed us to more closely examine the benefit assessment for our carbon, biodiversity and renewable schemes. We have done this and our findings have been summarised in the relevant sections below.

1.1.7. *Risk/Benefit Assessment*

18. The risk/benefit assessment has been linked to some areas of the business risk matrix and the “Willingness to Pay” surveys directly, for example, Security and Research & Development (R&D). Other links are less direct. In such cases the values have been derived by the opportunity benefit assessment prior to ELSA+ programme analysis for example:

- IT system enhancements.
- Accommodation (partial).

19. For further detail refer to Part B3 sections 2&6. We were able to add some additional offline benefits to schemes where Ofwat asked us to more closely scrutinise the benefits. This is discussed in the relevant sections below.

1.1.8. *Service Performance Observations*

20. There are no specific serviceability measures for M&G assets although M&G investment is critical to ensuring the serviceability of our assets and service provision to our customers.

1.1.9. *Quality Assurance*

21. Data in the form of risks and solutions has been entered into our BRM+ system; has been validated centrally by the Investment Planning team and quality assurance challenged for integrity and consistency. M&G investment is a disparate group of investments. In order to achieve good quality we challenged the data by a central function.
22. The AMP5 steering group has challenged the M&G process. This was done to remove any duplication, challenge the need for investment in AMP5 and ensure consistency of approach between each area.

23. 'Project Charters' as used in the Water and Sewerage service for data collection have been developed for each area of investment within M&G. Each investment area's asset data was then summarised and uploaded into BRM+.
24. Two challenges were set up with the AMP5 Steering Group:
- ⦿ Challenge 1 - This focussed on methodology and was high level. The emphasis was on approach taking into account working groups established; studies & surveys undertaken; whole life cost; UKWIR common framework; business consultation and data input.
 - ⦿ Challenge 2 - This was more detailed and gave the capital requirements and options available. It took into account investment scenarios (high, med, low); risks and assumptions; mandatory investment and investment opportunities.

1.1.10. *Common Framework Assessment*

25. To comply with the Ofwat requirements for capital maintenance planning, the need for M&G investment has been subject to the 3 stage Common Framework Assessment. These being:
- ⦿ Historical Analysis – Identifying historic levels of maintenance expenditure and serviceability indicator trends.
 - ⦿ Forward-looking Analysis – Identifying future maintenance expenditure to meet regulatory objectives.
 - ⦿ Conclusions – Comparing and explaining results of historical and forward-looking analysis, making the case for the required level of future maintenance.
26. Figure 2 below shows a summary of the assessment, highlighting historic drivers of investment in AMP4, the areas of continuing investment that are common to both periods and how the future is different.

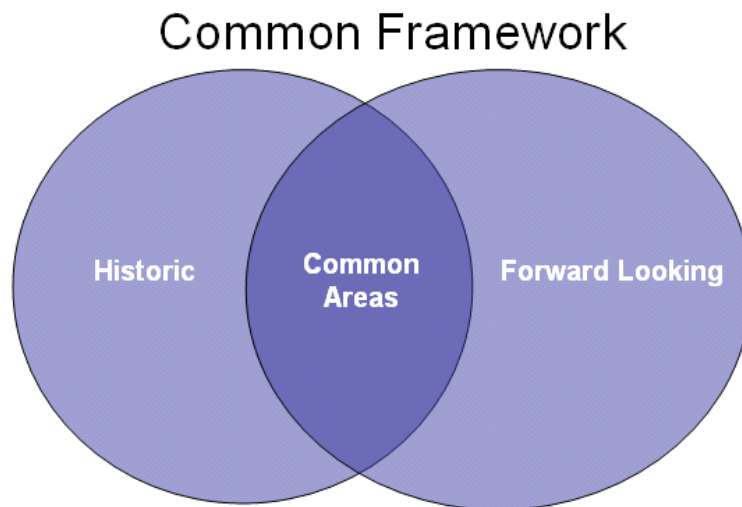


Figure 2 - Common Framework Diagram

1.1.11. *Plan for Delivery*

27. M&G investment has been presented for LEADA+ assessment as either individual schemes (e.g. renewable energy schemes) or blocks of investment based on similar asset types and predicted failure dates (e.g. IT where replacement of computers of the same age will be a block of investment in the relevant year, based on PR09 studies and whole life cost analysis).

1.2. **MANAGEMENT & GENERAL BUSINESS CASE BY ASSET GROUP**

1.2.1. *Management and General expenditure summary*

Management and General

Investment in Management and General is to maintain serviceability. It is broadly aligned to historic investment levels. Increases are attributed to facilitating R&D against the Strategic Direction Statement, the addition of Carbon reduction and Biodiversity Management expenditure not seen in the AMP4 programme and an increase in Access and Recreation expenditure due to increased customer demand.

However, this has been offset by some degree by transfers into other parts of the business plan, namely SEMD, SSSI and some Biodiversity expenditure into part B4 and the Ofwat removal of Wind Energy from appointed business.

All investment proposals have been established through LEADA+ as detailed in B3 Sections 2 & 6 (Approach to Asset Management Planning), based on cost benefit analysis and taking into account social and economic costs as detailed in C8 (CBA and Carbon Accounting).

AMP5 capex total:	£189.4	Net Benefit: Positive
AMP5 capex pa:	£37.88	Net Benefit Value: £1,205m
AMP4 capex pa	£36.55	Atypical capex value: £0

Typical historic investment i.e. AMP4 is £36.55 pa and has taken into trends in historic levels of investment.

Application of the Capital Maintenance Planning Common Framework has identified the following additional investment pressures above typical historic levels is :£1.33m pa

There is no atypical investment in M&G in our judgement.

JR09 Serviceability Forecast: Non Infra : Stable
Concluding Serviceability Assessment at PR09: Stable
Forecast 2015 Serviceability assessment: Stable

28. The common Framework approach has been undertaken for M&G investment. Table 4 below shows the AMP5 proposals compared to historical levels.

Common Framework Stage	£m p.a.	Comments on adjustment
Historical Analysis	35.188	7 yr average based on JR submissions (2001/02 – 2007/08)
	33.738	6 yr average based on JR submissions (2001/02 – 2006/07)
	36.55	AMP4 forecast
	36.55	Typical investment*
Forward looking analysis	36.55	To maintain stable serviceability with typical investment
	0	Addressing underlying serviceability trend
	0	'A' typical investment
	0	Major investment at strategic site
	1.33	External factors
	0	Impact of changes to other investment programmes
		Targeted LEADA+ investment planning
AMP5 Expenditure requirement	37.88	Gross of Grants & Contributions
Conclusions	2.692	Difference from historical 7 yr spend
	4.142	Difference from historical 6 yr spend
	1.33	Difference from AMP4 (used in historic comparison)

Table 4 AMP5 and historical investment proposals

1.2.2. *Information Technology*

1.2.2.1. *Challenges from OFWAT between DBP and Final Business Plan (FBP) and changes to the plan*

29. Between DBP and FBP there has been an increase in scope in the Information Technology (IT) submission. This is outlined as below;
30. The draft submission for IT totalled £104m. Following a subsequent review some omissions were identified. Since the DBP £2m has been added to the AMP4 IT programme to fit pollution prevention devices on a large number of Combined Sewer Overflows (CSOs) and Sewage Pumping Stations (SPSs). An equivalent addition was therefore required in AMP5 to replace these devices at the end of their asset lives. Two further areas were also identified as having insufficient funding in the DBP submission, the replacement of the GIS system Odyssey and the replacement of the Capital Management System (CMS). Following review with the AMP5 Steering Group, it was felt appropriate to include these additional sums. The FBP submission is now £109.6m.

1.2.2.2. *Introduction*

31. In AMP5 the primary issue is investment for asset replacement, as was also the case in AMP4. Yorkshire Water controls growth in numbers of assets by requiring a choice of technological support to be made to meet business needs. Our policy is to adopt whichever technology offers the greatest advantages and flexibility in meeting local business needs.
32. Asset replacement expenditure is life-cycle driven and there must be provision for growth. Software is constantly re-scoped as operators identify areas for system enhancements.
33. A full review of strategy in 2003 fed into the AMP4 programme development. The review has been refreshed each year. For AMP5 the principles of the Framework Assessment were followed. A review of the historical asset base of IT was created and an inventory of services provided and valued with the help of financial specialists in the regulatory team. Emphasis was placed on asset management throughout the process, using low/medium/high risk scenarios for assessment of needs.

1.2.2.3. *Data*

1.2.2.3.1. *Service and Asset Performance Observations*

34. The approach taken was based on and closely follows the approach used for the AMP4 submission. The steps were:

- ⦿ A full inventory of all the assets in each area was compiled
- ⦿ Asset lives for all assets were derived, based on historical analysis, experience and input from industry analysts such as Gartner
- ⦿ Unit costs have been applied to each asset type based on current prices, historical analysis and input from industry analysts.

35. Although the basis for the submission is asset replacement it has been important to take into account future growth. In 2003 a significant piece of work was undertaken to develop an IT Strategy for the following 5-7 years. It has been updated annually and has been overlaid onto the AMP5 investment requirements. This indicated some key focus areas for the AMP5 period:

- ⦿ Further growth and exploitation of telemetry and automation based on customer service demands
- ⦿ Emphasis on asset management and the data and systems needed to support this
- ⦿ The need to invest in enabling technologies across the range of the existing infrastructure to meet perceived future business need.

1.2.2.3.2. *Verification and Validation Process*

36. Data was entered into BRM+ for use in ELSA+ via an uploaded spreadsheet in annual blocks of expenditure for each asset type. The failure scenarios used were inability to manage data, inability to monitor & inability to access corporate applications.

IT Asset types:

- ⦿ Infrastructure
- ⦿ Telemetry asset renewal
- ⦿ Incrementals
- ⦿ Desktop/Mobile
- ⦿ Provision for Euro
- ⦿ AMP6
- ⦿ Systems development
- ⦿ Data Centres
- ⦿ Telecommunications
- ⦿ Telemetry growth.

37. Data entered onto BRM+ is subject to a quality assurance check to validate the risks and potential outputs of any investment. Solutions and failure scenarios have been validated by the Investment Planning team, as

well as the relevant M&G team. This has ensured the validity and consistency of all BRM+ entries within the system.

- 38. Each asset type area is led by a senior manager. All managers were required to attend a challenge process with the Information Technology Management Team (ITMT) to challenge the need for investment and ensure consistency. This process was done prior to the AMP5 Steering Group challenge process detailed in section 9.1.9.

1.2.2.4. Analysis

1.2.2.4.1. Comparison of Historic Forecast Activity and Expenditure

- 39. Table 5 below identifies the historic investment in IT assets:
- 40. IT investment is very comparable across all 3 AMP periods

Investment Area	Actual Expenditure		Proposed	Net Benefit
	AMP3 £m	AMP4 £m	AMP5 £m	£m
Information Technology	100.2	105.7	109.6	-45.226

Table 5: Information Technology Historical Expenditure Table

- AMP3 investment consisted of Systems Development, Hardware and Real Time Systems.
 - AMP4 investment consisted of Asset Replacement, Growth and Procurement.
 - AMP5 investment will consist of Asset replacement, Growth and Strategy.
- 41. These are captured in the figure 3 below after following the 3 stage Common Framework Assessment detailed in section 9.1.10.

M&G Alignment to Common Framework

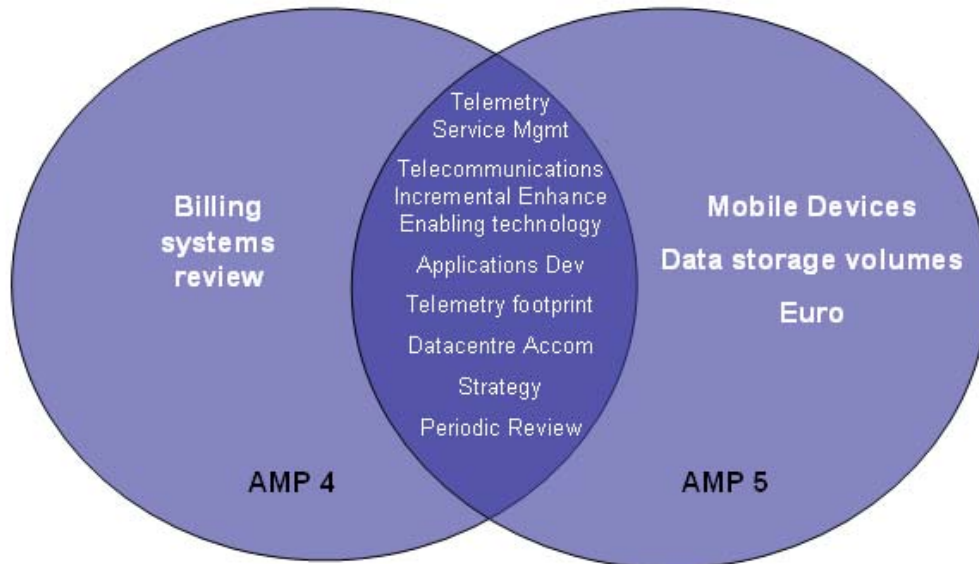


Figure 3 - IT Common Framework Representation

1.2.2.4.2. Comparative Analysis

42. Three main areas were reviewed:

Asset Replacement

- o Infrastructure – servers, storage hardware, PCs (including Laptops, Tough books, PDAs etc), printers, plotters plus infrastructure software licences.
- o Telemetry – SCADA, Instrumentation, PLCs, RTS Outstations, RTS Central Infrastructure.
- o Telecommunications, covering the voice network, core data network, security, inter-site links and contact centre.
- o Service Management, covering basic infrastructure to support central computer operations and software for the Help Desk, licence management etc.
- o Applications Development, covering all corporate applications.

Growth

- o Incremental enhancements to applications to cater for any new legal and regulatory requirements and for future change of core business processes.
- o Provision was made for the possible impact of the introduction of the Euro.

- Allowance was made for specific system growth which might be required to support the AMP6 planning processes.
- Changes in the telemetry footprint.
- Data storage volumes and file types.
- Numbers and types of mobile devices.

Strategy

- The IT Strategy developed in 2003 has eight programmes of work. Of these five programmes are enabling projects and three programmes of delivery projects. In devising an overall implementation plan for the whole IT Strategy it was important to consider both the importance of the projects in relation to each other and the relative importance of the individual projects to Yorkshire Water business.

43. Projects were divided into two types; ‘enabling’ projects which were required to modify the positioning of Yorkshire Water IT services and ‘delivery’ projects which deliver benefit to Yorkshire Water business operations.

44. The high level programmes are identified in figure 4 below:

Enabling Programmes	Delivery Programmes
<ul style="list-style-type: none"> • Telecommunications • Technology • Applications Methods • User Access • Operational Processes 	<ul style="list-style-type: none"> • Telemetry • Generic Applications • Business Applications

Figure 4 - Information Technology High Level Programmes

45. Yorkshire Water maintains a considerable asset base to deliver services to customers. In order to cost effectively manage this and to predict future expenditure, a considerable amount of IT and data is required.

46. The direction for these technologies is driven by a number of business steering groups including the AMP5 steering group. These groups are supported by practitioner led delivery group who design and implement the required IT systems.

47. In this area, the requirements for system asset replacement have been supplemented by:

- The need to embed AMP5 systems and processes
- The need to prepare for AMP6.

1.2.3. *Research & Development*

1.2.3.1. *Challenges from OFWAT between DBP and FBP and changes to the plan*

48. We have evaluated our R&D submission between DBP and FBP. We have removed expenditure associated with Brimac filters. This is because we have revised our submission under the Cryptosporidium driver in Part B4. We now plan to remove all our treatment works that have this kind of filtration, negating the need for R&D in this area.
49. We have revised and improved the robustness of R&D programme phasing. This has necessitated changes to the structure of solutions contained within our BRM+ system.
50. Ofwat challenged us in a number of areas regarding our R&D submission in the DBP. A query was raised (AST/YKY/032) and our response was supported by the Reporter.
51. To clarify our position on these matters:
52. The investment proposal in our plan for R&D is significantly different to the past. The opportunity afforded to set out our long-term future is summarised in our Strategic Direction Statement (SDS). This outlines the significant challenges facing us and highlights the importance we place in R&D to develop the sound science and technological solutions we will need to overcome them. Our costs include R&D investment which will help inform our understanding and position on emerging legislative and climatic issues. This will ensure future investment is based on clear definition of need (Known Risks Programme) and to work in partnership with the supply chain. Initially, this will be to define and develop future step-change technologies which will help us achieve our SDS aspirations (Aspirational Programme). The aspirational programme is discussed in more detail below.
53. The longer term planning risks will inevitably change and we will continue to reprioritise this investment on a quarterly basis. We will report this to Ofwat through our June Returns.
54. In Yorkshire investment in R&D has remained steady, averaging 0.6% turnover in AMP3 and AMP4. We plan to increase this to around 1.0% turnover in AMP5 and AMP6. This investment will continue to be subject to regular internal scrutiny and governance to ensure continued value for money from the Programme. During AMP4 R&D has enabled the business to make significant improvements to service provision and cost

savings in a ratio of more than 4 to 1. The gains from this are ultimately passed back to our customers.

55. Finally, the purpose of R&D investment is to acquire applied technical knowledge, understanding and to develop solutions which will enable business improvement and change. Most R&D expenditure is aligned to future capital investment and is therefore capitalised. We adhere to the regulatory accounting guidelines and our policies are scrutinised by our financial auditors. Assets (which take the form of pilot plants, prototype systems and devices, models, knowledge and data contained in reports and technical documentation) are depreciated over a number of years in line with how the findings are used to benefit the business.

1.2.3.2. *Introduction*

56. R&D investment covers investigatory research for short and long term water industry issues or new technology development. Assessment and development of innovative technology for first time use by Yorkshire Water has been supported by other institutions such as academia, commercial consultancies, the wider supply chain and as appropriate other water companies. The investment promoted for AMP5 has been based on the requirements of our SDS and identification of a clear business need to do so.
57. The AMP4 R&D Programme is aligned with our Company vision and the six underpinning vision chapters (see for example, B3 section 1.1 paragraph 2). Every project undertaken is benefits assessed against these chapters, at formulation, completion and implementation into the business. It is kept under regular review.
58. One example of R&D that has been successfully implemented in AMP4 is Sludge Phyto-conditioning (SPC) which is detailed below.
59. Capital investment in AMP4 on sludge treatment was designed to provide enhanced treated sludge products for recycling to agriculture. The preferred option was thermal drying and this was used as a basis for costs. SPC is an innovative and sustainable low capex, low opex, low energy technique. It achieves the same status of product as conventional sludge treatment but at a fraction of the cost, financially and environmentally. The process uses digested sludge cake which has been conditioned with wood dust or shredded green waste as a feed stock. It is laid out in beds on concrete to a depth of 0.8m and sown with tetraploid rye grass, a voracious grass species. A combination of physical (transpiration), chemical and biological process treats the agricultural grade material to produce a dry (60%dry solids) product with background levels of pathogens qualifying it as an enhanced treated product. Further

development has enabled the generic SPC product to feed into topsoil manufacture compliant with the BS3882 topsoil standard, by the addition of mineral, with the potential to declare the product as a non-waste.

The process is now adopted at six YW sites with the potential for 40% coverage (of recycled sludge) by the end of AMP4. The product has won a number of awards including Environmental Product of the year at the National Recycling Awards (2006), Most Outstanding Contribution to the Environment 2006 – Highly Commended by Horticulture Week and Green Apple – Sustainable Product (2006).

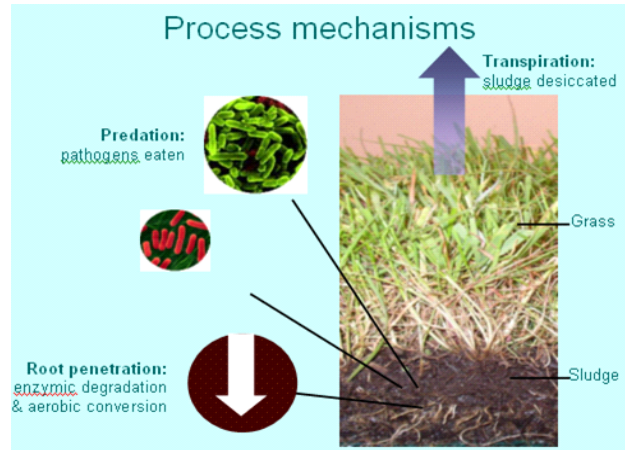


Figure 5: Sludge Phyto-conditioning Process

1.2.3.2.1. Business Requirements

60. R&D investment was promoted on the following programme basis:

Base Programme

- o Compliance with the revised Bathing Water Directive.
- o Incremental improvement to water, waste water and sludge treatment processes.
- o Assessment of renewable and energy efficiency technology.
- o Trunk main rehabilitation.
- o Sewer surveying and deterioration modelling including private sewers to be adopted.

Known Risks Programme

- o Compliance with the Water Framework Directive (WFD).
- o Mitigating against the effects of climate change (carbon management and sequestration).
- o Understanding and adapting to the effects of climate change and area flooding.
- o Sludge disposal loss of the land routes.

Aspirational Programme

- ⦿ Step change in leakage
- ⦿ Step change in water treatment processes
- ⦿ Facilitating integrated catchment management approaches
- ⦿ Low cost sensors telemetry, online process and compliance monitoring
- ⦿ Sewer rehabilitation and reduced/zero dig technologies
- ⦿ Supporting a step change in customer service

1.2.3.3. Data

1.2.3.3.1. Service and Asset Performance Observations

61. We have developed and implemented a quantitative risk/reward framework. This is used as a filter for high risk/low benefit proposals prior to input into BRM+ and as a macro assessment risk tool to achieve an appropriate balance for the R&D Programme. The populated model is reviewed every 6 months by the R&D Strategy Group and works to maximise value from the R&D Programme.

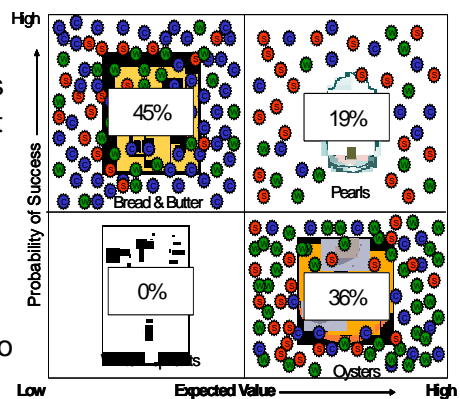


Figure 6: Risk/Reward Assessment

1.2.3.3.2. Verification and Validation Process

62. The R&D approach to PR09 planning was based on:
- ⦿ Use of established R&D governance processes covering the length and breadth of the business.
 - ⦿ Programme formulation using stakeholder workshops drawn from internal business experts, management teams, our framework suppliers and strategic university partners.
 - ⦿ Experienced water industry R&D managers and Statisticians.

63. A summary diagram of the process is shown in figure 7 below:

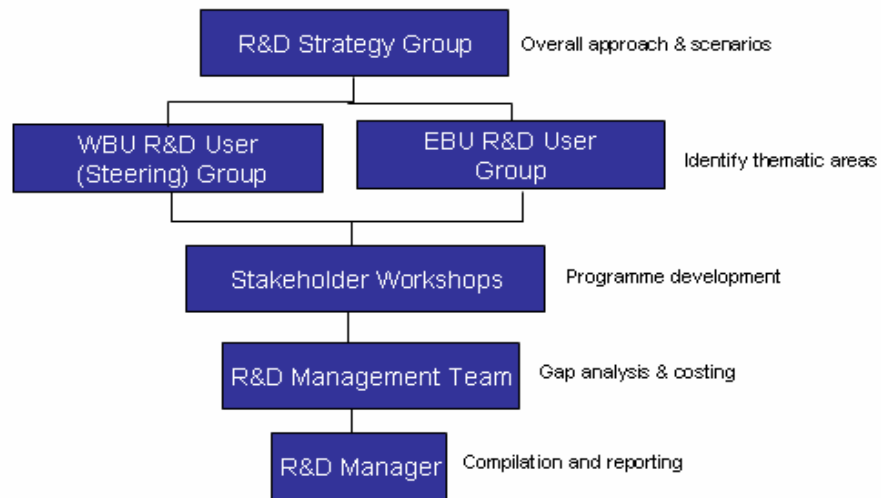


Figure 7 - R&D PR09 Planning Process

64. The data was entered into BRM+ manually, for use in ELSA+ by blocks representing the three programmes. For some of the drivers, different scenarios of expenditure were entered. Once the final costs were calculated for each area of the R&D programme, the information was then entered into BRM+ as follows:

- Base Programme (5 solutions)
- Known Risks Programme (5 solutions)
- Aspirational Programme (5 solutions)

65. Data entered onto BRM+ is subject to a quality assurance check to validate the risks and potential outputs of any investment. Solutions and failure scenarios have been validated by the Investment Planning team, as well as the R&D Programme Management Team. This has ensured the validity and consistency of all BRM+ entries within the system.

1.2.3.4. Analysis

1.2.3.4.1. Comparison of Historic Forecast Activity and Expenditure

66. Table 6 below identifies the historic investment in R&D assets

Investment Area	Actual Expenditure		Proposed	Net Benefit
	AMP3 £m	AMP4 £m	AMP5 £m	£m
Research & Development	16.1	16.4	32.43	1,112.190

Table 6: R&D Historic Expenditure Table

- o AMP3 investment consisted of Lead compliance, Urban Waste Water Treatment Directive (UWWTD), Waste Incineration Directive (WID) and Mains Rehabilitation.
- o AMP4 investment consisted of Freshwater Fisheries Directive (FFD), Biodiversity Action Plan, Sewer Condition, WFD)and Leakage.
- o AMP5 will consist of proposed investment in energy efficiency, WFD, Climate Change, Leakage and Sewer Rehabilitation and identified investment in the SDS

67. The investment promoted for AMP5 is based on the requirements of our SDS and identification of a clear business need to do so. In order to address our long term internal and external challenges we believe continued investment in R&D is crucial. In response, have developed a 25 year investment programme, at £32.43m for AMP5.

68. The elements of our AMP5 investment is captured in figure 8 below after following the 3 stage Common Framework Assessment detailed in section 9.1.10.

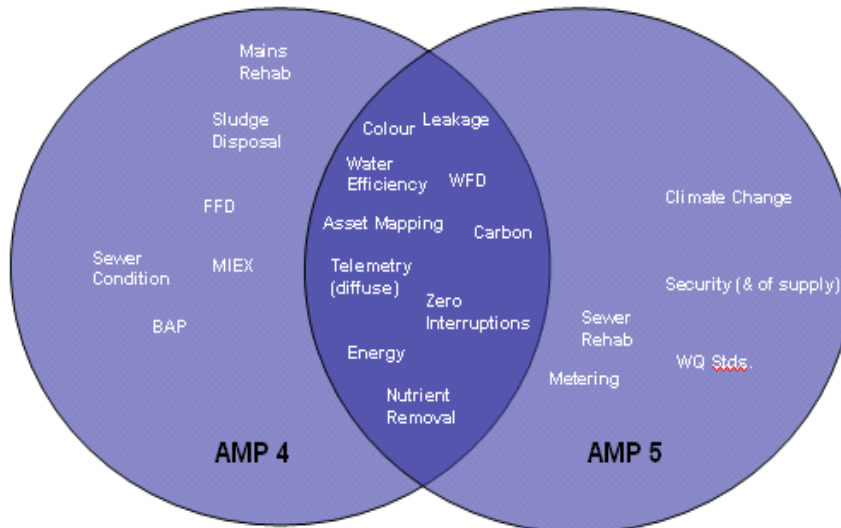


Figure 8 - R&D Common Framework Representation

1.2.3.4.2. Comparative Analysis

- 69. The AMP5 investment requirements have been split into three scenarios. Each was reviewed in terms of its level of certainty and risk and reflected in the way the programmes have been scored in BRM+.
- 70. Figure 9 below shows a summary of this. It describes the different levels of risk and cost of the programme (i.e. the base programme addresses the least numbers of business risk and cost, the scenario submitted in the plan addresses the greatest risk to the company and is the greatest cost).

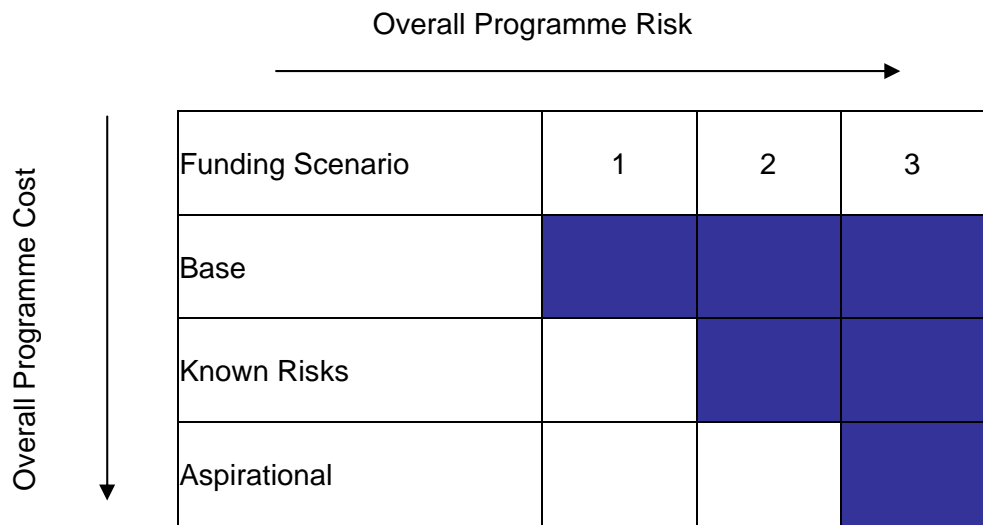


Figure 9: R&D Overall Programme Risk

- 71. Scenario 1: Base Programme
 - Supports the delivery of AMP5 capital programme, business change initiatives and current business vision.
 - Preparation against future known (well defined) investment drivers in AMP6, for example under the revised Bathing Waters Directive (BWD).
 - Investment in incremental technological change.
- 72. The characteristic of this programme is it incremental in nature and lower risk. Business need is well defined and projects will typically require shorter durations to realise business benefit.
- 73. Scenario 2 Known Risks - In addition to Base and/or Aspirational includes a funding provision for:

80. The removal of SEMD expenditure has reduced the programme by £12.88m. £12.06m of this has been transferred to the Water Service and £0.82m has been transferred to the Sewerage Service.
81. Remaining expenditure in this part of the plan is associated with non SEMD activity.

1.2.4.2. *Introduction*

82. Security investment has being carried out to comply with the company security policies in accordance with best practise.
83. Security investment was promoted on the following basis:
- ⦿ Health and Safety - regulatory requirement to comply with public safety HASAWA section 3, management regulations, 10 & occupiers liability acts 1957 & 1984.
 - ⦿ Base maintenance - items reaching end of asset life e.g. perimeter fencing causing a risk to security.

1.2.4.3. *Data*

1.2.4.3.1. *Service and Asset Performance Observations*

84. Business risks were identified with the level of security at our assets. This was linked to the existing business risk matrices to enable the investment requirements to be prioritised in accordance with the LEADA+ project.
85. Key assumptions made when putting the security programme together were as follows:
- ⦿ No Grant aid.
 - ⦿ No Provision for flood protection (this is in the Water Service and Sewerage capital programme requirements in section B6).
 - ⦿ Site Security Maintenance (Fencing, CCTV) would continue on the same basis as AMP4 investment which is to replace assets condition grade 4&5 (see section 9.2.3.3.2. for further detail).

1.2.4.3.2. *Verification and Validation Process*

86. The data was entered into BRM+ manually, for use in ELSA+ by each driver of expenditure e.g. DEFRA sites. For some of the drivers, different scenarios of expenditure were entered as stated in challenge 2 to the AMP5 steering group. The failure scenarios used were water quality, compliance with legal obligations and personal injury. Drivers used were either blocks of expenditure or site specific and are listed below:

- ⦿ Site Security Fencing.
- ⦿ WWTW security (response to increase in metal theft)

87. Data entered onto BRM+ is subject to a quality assurance check to validate the risks and potential outputs of any investment. Solutions and failure scenarios have been validated by the Investment Planning Team, as well as the relevant M&G Team. This has ensured the validity and consistency of all BRM+ entries within the system.

1.2.4.4. *Analysis*

1.2.4.4.1. *Comparison of Historic Forecast Activity and Expenditure*

88. Table 8 below identifies the historic investment in Security assets:

89. Expenditure in this group is comparable over the three AMP periods. Expenditure in SEMD has been transferred to part B4 where more details can be found.

Investment Area	Actual Expenditure		Proposed	Net Benefit
	AMP3 £m	AMP4 £m	AMP5 £m	£m
Security	11.8	7.39	9.20	-4.295

Table 8: Security Historical Expenditure table

- ⦿ AMP3 investment requirements were SRE security & fencing.
- ⦿ AMP4 investment requirements were SRE Security, Abloy locking systems, fencing & DEFRA sites.
- ⦿ AMP5 investment requirements proposed are security fencing and Sewerage service site protection.

90. The increase in investment in AMP5 investment is due to current condition profile of fencing.

91. We have identified additional expenditure due to our experiences of the increased number of metal thefts from many of our sewerage service sites. This is due to the demand for scrap metal. Our sewerage sites tend to be in more remote areas and sited away from houses compared to many of our water sites. Also these are inherently better protected because they carry greater risk to public health.

92. These are captured in figure 10 below after following the 3 stage Common Framework Assessment detailed in section 9.1.10.

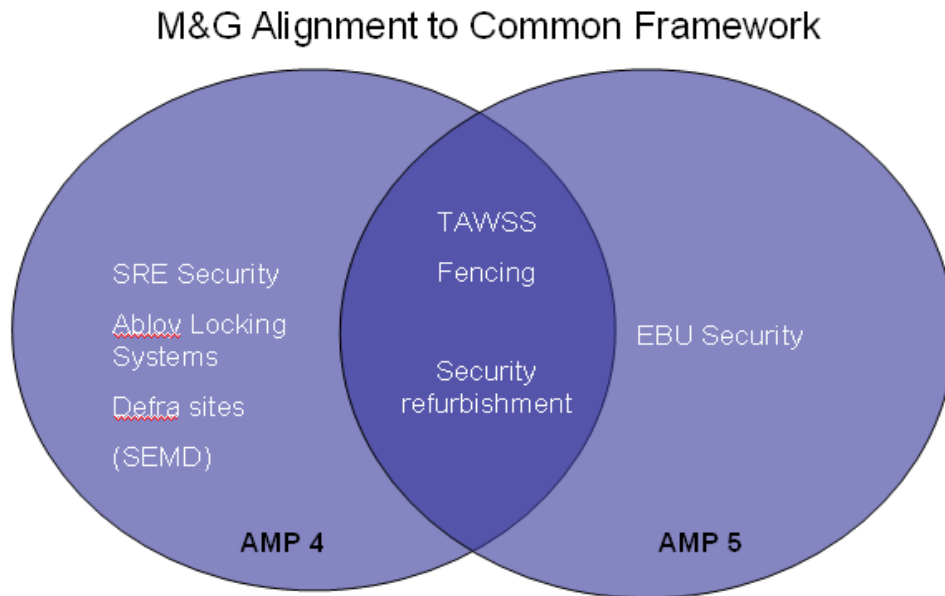


Figure 10 - Security Common Framework Representation

1.2.4.4.2. Comparative Analysis

Fencing Maintenance

93. Condition grade information (1 – 5) was received from the business units. Where the condition grade was 3 and 4 the need for replacement fencing was identified for AMP5. These sites were given a security risk assessment (high, medium or low). Standard costs multiplied by boundary measurements taken from GIS were allocated to each category.

WWTW security enhancements

94. The sites and their security arrangements were scored using the Ofwat condition grade assessments and appropriate costs built up for the level of protection required. We took a risk based approach to these sites and the investment plan covers the need to provide minimum security standards at our most vulnerable sites.

1.2.5. Renewable Energy

1.2.5.1. Introduction

1.2.5.2. Challenges from OFWAT between DBP and FBP and changes to the plan

95. We have removed all our investment associated with wind energy from our plan.

96. The FBP includes investment in Hydro energy and CHP energy. We have removed the Hydro plant at Scar House on the basis that it gives no benefit to customers and replaced it with a similar scheme at Eccup. There is a reduced cost for this of £-0.512m.
97. We note that Ofwat reduced all our renewable energy costs in the CIS baseline by 15%. We have attempted to provide a greater level of information on our Cost Benefit Analysis (CBA).
98. The costs for our renewable energy programme carry little or no scope for cost reductions in our FBP. The methodology for costs is robust and has been challenged in by our Reporter.
99. Ofwat challenged us to perform an additional assessment of the benefits in this asset group. We have performed a benefits assessment for all renewable schemes. All our renewable energy schemes have a positive benefit to customers and the environment. The benefit of the renewable energy schemes has been assessed using the capital and operational costs for the solutions and the carbon as calculated in the methodology set out in Part C8 to build and maintain the assets. With renewable energy schemes there is a choice between selling Renewable Obligation Certificates (ROCs) or claiming the operational carbon reductions as a benefit using the shadow price of carbon. The most cost beneficial approach is to claim ROCs. As a result the operational carbon reductions have not been included as selling ROCs means we forego this benefit.
100. Table 9 summarises the benefits of our proposals as requested in the CIS baseline and clearly show the benefits to both customers and the company of our Hydro and CHP schemes in terms of CBA.

Renewable Energy - Carbon & Benefit								
Solution Title	Base GHG to Build (tCO ₂)				Base GHG to Operate (tCO ₂)			Cost Benefit
	2010/11	2011/12	2012/13	Total	2012/13	2013/14	2014/15	
Damfask Hydroelectric Power Generation	114.879	50.517	0.000	165.396	3.855	3.855	3.855	0.215703
Eccup WTW Hydro electric Power Generation	289.111	137.320	0.000	426.431	2.313	2.313	2.313	2.008566
Aldwarke CHP Advanced Technology	129.101	97.810	0.000	226.911	2.313	2.313	2.313	1.106683
Caldervale CHP Advanced Technology	42.143	48.999	0.000	91.142	2.313	2.313	2.313	0.466628
Bridlington CHP Advanced Technology	54.362	57.105	0.000	111.467	2.313	2.313	2.313	0.554082
Mitchell Laithe's CHP Advanced Technology	318.944	173.891	0.000	492.834	2.313	2.313	2.313	2.499772
Naburn CHP Advanced Technology	247.105	147.722	0.000	394.827	2.313	2.313	2.313	1.987155
Old Whittington CHP Advanced Technology	108.093	87.583	0.000	195.676	2.313	2.313	2.313	0.956487
Sandall CHP Advanced Technology	42.143	48.999	0.000	91.142	2.313	2.313	2.313	0.466628
Hull CHP Advanced Technology	34.455	523.616	245.109	803.180	0.000	2.313	2.313	4.045927
TOTAL	1,380.335	1,373.562	245.109	2,999.006	22.359	24.672	24.672	

Table 9: Summary of carbon build and operation and CBA of Renewable Energy programme

101. Finally, we were asked to comment on how the CHP programme interacts with the sludge strategy. Our proposals are designed to accord with UK government policy by complying with foreseeable legislative drivers. In addition, energy generation is planned to help meet the UK's aspirations to increase renewable generation and cut carbon dioxide emissions. Target production this year is 10GWh/year from existing sites. The target for the start of AMP5 of 42GWh/year is based on production from existing and new units that are approved for installation this AMP. Additional generation may be possible subject to available funding and approval for further units to be installed.
102. Producing more biogas from the same existing sludge allows us to provide:
- ⦿ Supplementary renewable heat during the winter months, which would allow us to maintain digester temperatures and throughputs at these sites and avoid diverting imported sludge away and therefore increasing tanker mileage
 - ⦿ Renewable electricity for on-site use which further reduces our cost of sludge treatment
103. We can confirm that all our income generated from ROC's is netted off against the operating cost. It is not accounted as other income.

1.2.5.2.1. *Business Requirements*

104. Renewable Energy investment was promoted on the following basis:
- ⦿ Compliance+ - The Government is encouraging renewable energy generation by the water industry and has set national future target production levels. These renewable energy projects contribute towards the national performance. Renewable energy contributes to meeting the requirements for a more sustainable water supply operation and provides a means of mitigation against climate change.
 - ⦿ Value+ - Value (cost saving) is the primary driver for renewable energy investment. Embedded generation off sets the cost of electricity purchase which is more than twice the value of exported power. Self generation also provides some protection against further energy price rises. The cost saving within the AMP5 period is being passed back to customers through opex reductions.

1.2.5.3. *Data*

1.2.5.3.1. *Service and Asset Performance Observations*

105. Hydro energy has been the subject of feasibility reviews by framework consultants. CHP is well understood in the business and has been prepared after BU review by business experts.

106. Hydro: Two phases of hydro study were completed for potential AMP4 sites. From this a detailed study was completed indicating a potential build in the future (AMP5). Following a wider business review a third phase of desk study was completed in early 2008. Hydro is less attractive than other power sources but those projects that are feasible and provide the greatest economic benefit as detailed above have been included.



Figure 11: Loxley
WTW Hydro Electric

107. CHP: For AMP4 a study identified potential sites. Most of the potential power generation has now been installed. Following further review by Yorkshire Water experts, the potential of enhanced digestion was recognised and an expert view was given for additional biogas and power production.



Figure 12: Mitchell Laithes CHP
Plant

1.2.5.3.2. Verification and Validation Process

108. The data was entered into BRM+ manually, for use in ELSA+ by each potential site for each investment area (listed below). These were entered as lump sums in BRM+ with the opex of capex screen completed which gives you an indication of the best payback schemes. The failure scenario used was a cost saving initiative. Investment areas entered into BRM+ were:
- Hydro schemes.
 - CHP schemes.
109. Data entered onto BRM+ is subject to a quality assurance check to validate the risks and potential outputs of any investment. Solutions and failure scenarios have been validated by the Investment Planning Team,

as well as the relevant M&G team. This has ensured the validity and consistency of all BRM+ entries within the system.

- 110. This area of investment was challenged at the Renewable Energy Steering Group as well as the Energy Steering Group. This was to ensure consistency and was done prior to the AMP5 Steering Group challenge process detailed in section 9.1.9.

1.2.5.4. Analysis

1.2.5.4.1. Comparison of Historic Forecast Activity and Expenditure

- 111. Table 10 below identifies the historic investment in renewable energy assets:
- 112. AMP5 investment will be significantly reduced compared to AMP4. Wind power has been removed from the FBP.

Investment Area	Actual Expenditure		Proposed	Net Benefit
	AMP3 £m	AMP4 £m	AMP5 £m	£m
Renewable Energy	0.0	19.13	4.44	14.308

Table 10: Renewable Energy Historical Expenditure Table

- ⦿ No investment was proposed for renewable energy in AMP3.
- ⦿ AMP4 investment consisted of wind energy (Loft some Bridge & Hull), Hydro & CHP schemes.
- ⦿ AMP5 proposals consist of Hydro & CHP schemes.

- 113. AMP5 expenditure is broken down as follows in table 11:

Renewable Investment Type	AMP5 £m
Hydro	0.88
CHP	3.56
Total	4.44

Table 11: AMP5 Renewable Energy Investment Type

- 114. These are captured in figure 13 below after following the 3 stage Common Framework Assessment detailed in section 9.1.10.

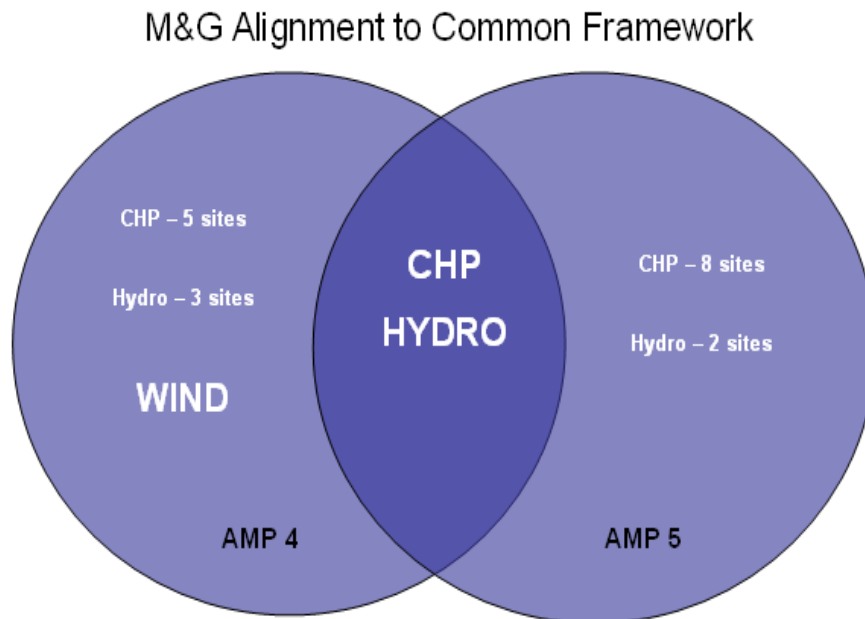


Figure 13 - Renewable Energy Common Framework Representation

1.2.5.4.2. Comparative Analysis

115. The key driver for the decision to develop renewable energy is economic. Costs for hydro have been estimated by framework consultants within feasibility reports. These estimates have been informed by AMP4 experience. For CHP the costing assumes the development of schemes only with appropriate payback. The financial benefit is thus crucial to the decision to invest.
116. The financial benefits assume the current value of power and Rocs. Both have been reasonably stable for 3 years and the standard values used for AMP4 schemes and benefits have been applied.

1.2.5.4.3. Estimate of capex and opex of Interventions

117. Table 12 summaries the capex and opex interventions of the renewable energy programme

Renewable Energy - Capex						
Solution Title	2010/11 (£m)	2011/12 (£m)	2012/13 (£m)	2013/14 (£m)	2014/15 (3m)	Total Capex (£m)
Damfask Hydroelectric Power Generation	166,750	73,327	0	0	0	240,077
Eccup WTW Hydro electric Power Generation	444,524	195,476	0	0	0	640,000
Aldwarke CHP Advanced Technology	182,586	134,317	0	0	0	316,902
Caldervale CHP Advanced Technology	52,807	62,430	0	0	0	115,237
Bridlington CHP Advanced Technology	70,057	73,990	0	0	0	144,046
Mitchell Laithes CHP Advanced Technology	495,316	253,726	0	0	0	749,041
Naburn CHP Advanced Technology	373,888	211,901	0	0	0	585,789
Old Whittington CHP Advanced Technology	150,027	118,860	0	0	0	268,887
Sandall CHP Advanced Technology	52,807	62,430	0	0	0	115,237
Hull CHP Advanced Technology	42,216	854,707	370,559	0	0	1,267,481
TOTAL	2,030,978	2,041,164	370,559	0	0	4,442,697

Table 12: Capex interventions of renewable energy programme

Renewable Energy - Opex						
Solution Title	2010/11 (£m)	2011/12 (£m)	2012/13 (£m)	2013/14 (£m)	2014/15 (£m)	2015/16 (£m)
Damfask Hydroelectric Power Generation		-0.015	-0.030	-0.030	-0.030	-0.030
Eccup WTW Hydro electric Power Generation		-0.030	-0.060	-0.060	-0.060	-0.060
Aldwarke CHP Advanced Technology		-0.020	-0.041	-0.041	-0.041	-0.041
Caldervale CHP Advanced Technology		-0.007	-0.015	-0.015	-0.015	-0.015
Bridlington CHP Advanced Technology		-0.009	-0.018	-0.018	-0.018	-0.018
Mitchell Laithes CHP Advanced Technology		-0.048	-0.097	-0.097	-0.097	-0.097
Naburn CHP Advanced Technology		-0.038	-0.076	-0.076	-0.076	-0.076
Old Whittington CHP Advanced Technology		-0.017	-0.035	-0.035	-0.035	-0.035
Sandall CHP Advanced Technology		-0.007	-0.015	-0.015	-0.015	-0.015
Hull CHP Advanced Technology			-0.083	-0.165	-0.165	-0.165
TOTAL	0.000	-0.193	-0.469	-0.551	-0.551	-0.551

Table 13: Opex effects of renewable energy programme

118. Table 14 below shows the proposed renewable energy schemes in summary and their benefits in terms of energy generation.

Investment Type	Generation		Total
	Used on site MHz pa	Export MHz pa	
Hydro	655	565	1220
CHP	5570	0	5570
Total	6225	565	36790

Table 14: Renewable Energy schemes with Energy Benefits

119. Table 14 demonstrates that we are using energy more efficiently on existing appointed business installations. All energy savings are 100% within the boundary of the site.

1.2.6. Vehicles & Plant

1.2.6.1. Challenges from Ofwat between DBP and FBP and changes to the plan

120. There are no changes in the Fleet programme between DBP and FBP

1.2.6.2. Introduction

121. Day to day management is done by a management Company with its dedicated contract manager using the fleet management company’s own software ‘Fleet Dynamics’ resident in Yorkshire Water computers. All data on purchases and risks is available. The data has been analysed over a 5 year historical period to determine what is due for replacement.

122. The tender award was based upon several criteria including compliant operating procedures, performance and cost. The process ensured that a robust and efficient process was carried out with regard to fleet management.



Figure 14: New style fleet van

123. When we looked at procuring the next generation of Field Operations vehicles we concentrated on 3 main areas:
- ⦿ Display Screen Equipment (DSE) compliance as technicians now use laptops on a daily basis.
 - ⦿ Larger dirty area to carry more equipment.
 - ⦿ Clean area to provide office space to work which reduces the need to return to site.

1.2.6.2.1. *Business Requirements*

124. Fleet investment was promoted on the following basis:
- ⦿ Company strategy - Review of fleet inventory to determine assets that had an end of asset life within the AMP5 period.
 - ⦿ Health & Safety - Regulatory Health & Safety risks on any vehicles or item of plant.
 - ⦿ People+ - This includes Yorkshire Water's 'Great Place to Work' policy.

1.2.6.3. *Data*

1.2.6.3.1. *Service and Asset Performance Observations*

125. We identified the key business users of fleet components and the business risks and benefits associated with the number of vehicles and plant items currently available to the Company.
126. The Fleet Management Team, in consultation with the business users carried out the following activities:
- ⦿ Review of fleet inventory to determine those assets with an end of life predicted within the AMP5 period. (Plant review was completed in Aug 2007)
 - ⦿ Review of these assets to determine whether they were required in AMP5 - for example a change of process may result in an asset becoming surplus to requirements
 - ⦿ Review of new assets to see if still required as a result of other investment schemes
 - ⦿ Vehicle lives based on whole-life costs and revised specifications
 - ⦿ Vehicles/plant to be purchased on a whole life cost basis.

127. We have worked closely with the business units on a long term strategy including vehicle size options. For example mobile workers Field Technicians working on the Customer Service part of the business were using laptops in Combo vans with no office space. Now we are using Vivaro vans (see Figure 15) that have office space allowing for mobile working and increased space to carry equipment. This avoids the need to report to base every morning and is DSE compliant.



Figure 15: - Vivaro van with office space

1.2.6.3.2. *Verification and Validation Process*

128. The data was entered into BRM+ for use in ELSA+ in annual blocks of expenditure for each asset type. For every solution block of expenditure there are 3 failure scenarios attributed, health & safety, people + and company strategy. Asset types used were:

- ⦿ Car derived vans
- ⦿ Land Rover
- ⦿ Plant
- ⦿ Panel vans
- ⦿ Tankers
- ⦿ 4x4 Utility.

129. Data entered onto BRM+ is subject to a quality assurance check to validate the risks and potential outputs of any investment. Solutions and failure scenarios have been validated by the Investment Planning Team, as well as the relevant M&G Team. This has ensured the validity and consistency of all BRM+ entries within the system.

1.2.6.4. *Analysis*

1.2.6.4.1. *Comparison of Historic Forecast Activity and Expenditure*

130. Table 15 below identifies the historic investment in Vehicles & Plant assets:

131. Investment in Vehicles & Plant is comparable over all three AMP periods.

Investment Area	Actual Expenditure		Proposed	Net Benefit
	AMP3 £m	AMP4 £m	AMP5 £m	£m
Vehicles & Plant	9.7	8.92	9.49	102.54

Table 15: Fleet Historical Expenditure Table

132. Fleet is very similar between each AMP with the majority of the expenditure used for like for like vehicle & plant asset replacement.

133. These are captured in figure 16 below after following the 3 stage common framework assessment detailed in section 9.1.10.

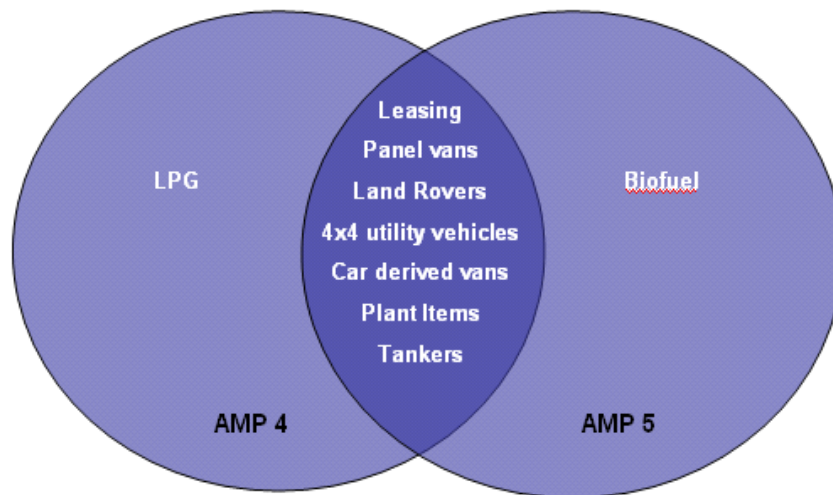


Figure 16 - Fleet Common Framework Representation

1.2.6.4.2. Comparative Analysis

134. Asset replacements were based on end of asset life and costs formulated on a like for like basis. Data was gathered from our Fleet Management System allowing us to categorise by asset expiry date.

135. Whole life costs are incorporated in every vehicle we procure, a typical example of this being the Vauxhall Vivaro. Our old style panel vans used to have a fleet asset life of 6 years or 120,000 miles. To take advantage of new technology, longer service schedules and vehicle warranty the life of the Vivaro now has a 7 year asset life.

136. Our whole life costs are built using the following areas:

- Vehicle cost
- Racking cost
- Maintenance cost
- Miles Per Gallon
- Depreciation
- Residual values

137. A plant audit was carried out, this enabled us to check condition and extend the asset life where applicable, giving us greater whole life costs.

1.2.6.4.3. Revised Vehicle Type Replacement Cycles

138. The assessments made based upon whole life costing have identified the vehicle replacement cycles as set out in table 16 below. These life cycles have been amended following a review of our asset performance and the mileage accrued by our assets. The revised replacement cycles were based on an ongoing technological improvement in vehicle specifications, life expectancy and the expert judgement of the Fleet Management Team. The information was used for the prediction of failure. Vehicle asset types listed below:

Vehicle Type	Difference from PR04
Car derived van	Increased from 5 to 6 years
Land Rovers	Increased from 6 to 7 years
4x4 Utility	As before
Panel vans	Reduced from 8 to 7 years
Tankers	As before
Plant	As before

Table 16: Vehicle Asset Type

1.2.7. Land, Property & Planning

1.2.7.1. Challenges from OFWAT between DBP and FBP and changes to the plan

139. We have moved expenditure associated with achieving the target condition of three key Sites of Special Scientific Interest (SSSI's) to Part B4 of the FBP. A full explanation of this transfer can be found in Part B4, section 1.12.

1.2.7.2. Introduction

140. The drivers of investment in Land, Property & Planning in M&G which are detailed below:

Rural Estate

- Yorkshire Water has more than 240 agricultural tenants managing a variety of land, farm buildings and houses. These must be fit for agricultural purposes and governed by legislation which is very different from commercial properties law. There are many provisions for dividing responsibilities between tenants and landlords.

Housing Stock

- Yorkshire Water has 30 residential properties adjacent to operational sites that require maintenance as part of the tenancy agreement.

Drainage

- This was thought to be an issue which would be dealt with in AMP4 where investigations have shown that the cost estimates were significantly understated. We are aware that many farms will be at risk of causing pollution incidents (for example problems of slurry from dairy farms) and this remains an issue for resolution in AMP5.

1.2.7.2.1. Business Requirements

141. Land Property and Planning investment was promoted on the following basis:
- Legal obligations - Statutory drivers including agricultural, tenancy legislation and landlord obligations.
 - Health and Safety - Rural Estate/Drainage/Residential are statutory landlord obligations.

1.2.7.3. Data

1.2.7.3.1. Service and Asset Performance Observations

142. Infrastructure & renewal scheme assets were identified and surveyed by Thomasons (60 approximately) who prepared detailed reports of problems, solutions and priorities based on Yorkshire Water requirements. The approach built on previous work which had seen some risks escalate above acceptable parameters for our tenanted properties.



Figure 17 Smith's Building at Holen House

143. Drainage was identified as an AMP4 scheme but initial cost assessments showed that planned investment levels would be inadequate. Funding was

diverted to deliver an investigation that has informed investment delivery in AMP5. Earlier investment programmes were limited to a reactive approach as and when drainage was perceived to be problematic.

1.2.7.3.2. *Verification and Validation Process*

- 144. The data was entered into BRM+ manually, for use in ELSA+ by annual blocks of expenditure for each investment area (listed below). For some of the investment areas different scenarios of expenditure were entered as stated in challenge 2 to the AMP5 Steering Group. Failure scenarios used were legal compliance, health & safety, water quality, environmental pollution, compliance +, people +, service +, society & value+.

Investment Areas:

- Rural Estate Infrastructure & Renewals.
- Housing Stock Infrastructure & Renewals.
- Drainage.

- 145. Data entered onto BRM+ is subject to a quality assurance check to validate the risks and potential outputs of any investment. Solutions and failure scenarios have been validated by the Investment Planning Team , as well as the relevant M&G Team. This has ensured the validity and consistency of all BRM+ entries within the system.
- 146. We cross referenced other work in the plan including work around carbon reduction and work around the WFD to ensure there was no duplication. Expert review was sought with the Yorkshire Water SSSI Steering Group and the DEFRA Major Land Owners Group.

1.2.7.4. *Analysis*

1.2.7.4.1. *Comparison of Historic Forecast Activity and Expenditure*

- 147. Table 17 below identifies the historic investment in LPP assets:

Investment Area	Actual Expenditure		Proposed	Net Benefit
	AMP3 £m	AMP4 £m	AMP5 £m	£m
Land, Property & Planning	0.0	2.64	4.03	9.33

Table 17: Land, Property & Planning Historical Expenditure Table

- 148. There is an increase in scope for AMP5 expenditure compared to AMP4.due to Infrastructure renewals.
 - AMP3 had no investment in Land Property and Planning

- o AMP4 investment consisted of SSSI, Sheep Dips, Fuel Stores, Drainage and Maintenance Reports
 - o AMP5 investment will consist of expenditure in infrastructure Renewals & Replacement, YWS Land Assets, Planned Maintenance and Drainage.
- 149. The AMP5 programme includes survey work done by external consultants which requires residential properties and rural estates to be in a steady state position.
- 150. These are captured in figure 18 below after following the 3 stage common framework assessment detailed in section 9.1.10.

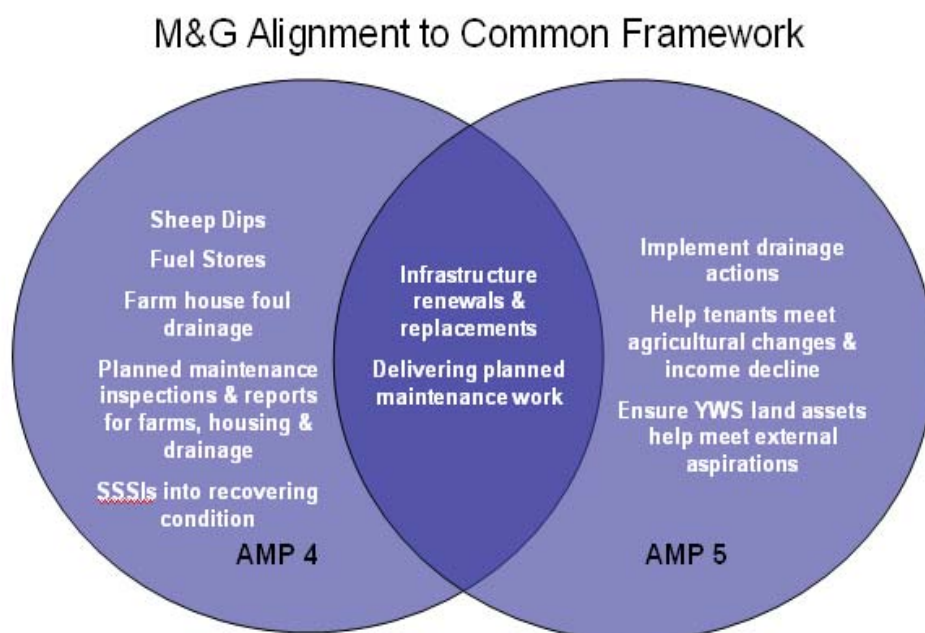


Figure 18 - Land, Property & Planning Common Framework Representation

1.2.7.4.2. *Comparative Analysis*

- 151. Infrastructure & renewal scheme cost estimates were prepared as part of the detailed surveys & reports.
- 152. Drainage scheme costs were based on data observed in similar schemes about similar work on non-owned assets. Investigations in AMP4 have produced indicative cost levels.

1.2.8. *Carbon*

1.2.8.1. *Challenges from OFWAT between DBP and FBP and changes to the plan*

153. We have removed our Water service and Sewerage service pump efficiency schemes from M&G and put them into the appropriate parts of the maintenance plans. This is a reduction of £2.65m.
154. We have also removed a scheme associated with awareness of carbon and water efficiency. The value of the scheme was £0.144m.
155. We were challenged to perform additional assessments for this area. The carbon schemes benefit to customers has been assessed using the capital costs and operational savings for the solutions as well as the carbon impacts to build, maintain and operate the assets. Unlike the renewable schemes where ROCs are claimed, the operational carbon savings from energy reduction have been included in the assessment. These savings are included in the carbon emissions projections and Carbon Reduction Commitment cost assessment. No other benefits have been included when assessing the schemes. All of the schemes assessed and included in the FBP are cost beneficial.

1.2.8.2. *Introduction*

156. The Government has set stretching targets for Greenhouse Gas (GHG) emission reductions in the Climate Change Act 2008. The long term goal is an 80% reduction in GHG emissions by 2050 (1990 baseline). Targets are set at a national rather than an industry level.
157. There are 4 main drivers for the investment in carbon reduction. These are set out below.
158. Compliance with and optimisation of performance in the Carbon Reduction Commitment (CRC).
- ⦿ The CRC is anticipated to cost the business in the region of £2.7m a year by 2013. It is essential that we take action to ensure that we are managing our involvement in the scheme as effectively as possible. We must make allowance purchases and sales based on robust scenario modelling. It is also important to be able to assess when it becomes more cost effective to make further investments in energy efficiency to improve performance, rather than accept performance penalties. The proposed Carbon Management System scheme addresses both these needs.
159. Cost effective investment in energy efficiency to reduce power costs and improve our performance in the CRC.
- ⦿ With energy prices forecast to increase over the next AMP and there are increased penalties for energy consumption through the CRC. It is important that we take every opportunity to reduce consumption

through investment in energy efficiency where it is cost effective to do so.

- 160. Government and stakeholder expectations.
 - o Expectations of the Water Industry commitment to carbon reduction are high, as highlighted by the following excerpts from DEFRA documents:
 - o “The Government would like to see continued reductions in the industry’s carbon footprint.” Social and Environmental Guidance to Ofwat, Section 2.33, p.10.
 - o “The Government would encourage Ofwat to actively support companies that want to exceed CRC targets through voluntary action.” Social and Environmental Guidance to Ofwat, Section 2.34, p.11.
 - o “The Government expects companies to fully meet any obligations under the CRC and that no barriers will be put in place to achieving the scheme’s objectives and requirements.” Social and Environmental Guidance to Ofwat, Section 2.34, p.11.
 - o “Vision for the future: A water industry contributing fully to the achievement of national emission reduction targets and maximising its potential for renewable energy use and generation.” Future Water, p.70.

- 161. Our company vision
 - o This identifies tackling climate change and mitigating our carbon footprint is one of the top 10 strategy priorities outlined in our SDS. We make a clear commitment to reducing carbon through our pledge to ‘meet GHG emissions reduction targets as set by Government’.

- 162. Yorkshire Water has recently been awarded accreditation under the national Energy Efficiency Accreditation Scheme (EEAS). The scheme is run by the Carbon Trust and recognises best practice in energy efficiency through management commitment, investment in energy efficiency and improvements in energy performance.



Fig 19 Energy Efficiency Accreditation Logo

- 163. This accreditation recognises achievement for our on-going efforts to improve energy management and performance. It will also improve our performance within the Introductory Phase of the CRC.

1.2.8.2.1. *Business Requirements*

164. Carbon investment was promoted on the following basis:
165. Compliance+
- ⦿ The Government is keen to see carbon reductions across the sector and has included the Water Industry in the forthcoming CRC.
 - ⦿ The Carbon Management System optimising emissions trading opportunities under the CRC. It will ensure we are compliant with legislation through effective management of emissions and avoidance of fines, reducing costs to the business.
 - ⦿ The energy efficiency schemes will help to improve our performance in the CRC. These schemes also provide significant environmental benefit and help to improve the sustainability of our operations.
166. Partners
- ⦿ There is an opportunity to work with a number of our partners on these initiatives and share learning to drive further improvements.
167. Society
- ⦿ These schemes enhance our reputation and relationships with key stakeholders. Mitigating climate change is one of the key environmental issues identified by our Environmental Advisory Panel (EAP). There is likely to be both regional and national media interest in these activities. Society will see clear benefits in terms of reduced carbon emissions.
168. Value+
- ⦿ Value (cost saving) is a key primary driver for energy efficiency investment. These schemes reduce our overall energy use and therefore the cost of this to the business. This is particularly important in the current energy market and with the prospect of emissions trading by the start of the AMP.
169. People+
- ⦿ Employees will benefit from increased visibility of energy and carbon data. This will improve understanding and allow the process to be managed more efficiently and effectively.

1.2.8.3. Data

1.2.8.3.1. Service and Asset Performance Observations

170. Arup was contracted to work with YW colleagues to identify the carbon mitigation options available and the costs and carbon savings associated with these. Within this process a number of brainstorming workshops were held with key representatives from across the business and Arup experts to collate initial ideas on projects. A climate change workshop, looking at both carbon mitigation and adaptation was also held with our EAP. This is an independent advisory panel of 25 key environmental stakeholders (including the Environment Agency (EA), Natural England, Royal Society for the Protection of Birds and Yorkshire Wildlife Trust). Over 35 possible carbon mitigation projects were identified for inclusion in our submission.

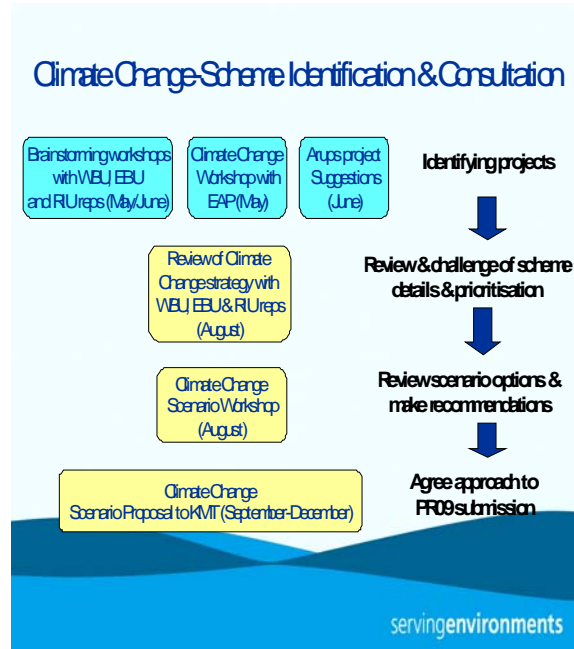


Fig 20 Climate Change Scheme Identification and Consultation Diagram

171. A number of challenge sessions were held to refine the list and prioritise key areas for investment. During the process a number of projects were removed from this list and included in the other relevant areas of the programme, including R&D and Renewable Energy, to avoid any duplication.

1.2.8.3.2. Verification and Validation Process

172. The full list of schemes was scored against criteria agreed with our EAP. This provided a cost and benefit score for each of the projects which were then plotted on a matrix to identify the most cost beneficial. Our Panel provided their views on which of the projects they considered to be of highest priority in delivering the greatest environmental benefit. This information was used to identify a shortlist of projects which were entered into BRM+.

173. We worked with colleagues in Energy, R&D, Land Property and Planning, Environmental & Catchment and WFD Teams to ensure there was no duplication. Expert review was sought at regular intervals and projects were revisited with the EAP in order to ensure proposals were in line with stakeholder views.
174. The data was entered into BRM+ manually, for use in ELSA+ by each potential area of investment (examples listed below). For some of the areas of investment different scenarios of expenditure were submitted. These were entered as lump sums in BRM+ with the opex of capex screen completed showing operating cost savings through capital investment. The failure scenarios used were Compliance +, Partners, People +, Society, Value +, Cost Saving Initiative, Inability to Monitor, Inability to Manage Data, Inability to Relay Information.
175. Three schemes are proposed for investment:
176. Motor and Gearbox efficiency
- The implementation of a systematic asset replacement programme to improve the efficiency of our asset base and ensuring all equipment runs on auto rather than manually.
177. Wider use of SCADA
- Increasing visibility of operating costs at process or asset level, improving our ability to optimise energy efficiency.
178. Integrated Carbon Management System
- Ensuring compliance with first capped phase of CRC through development of existing energy and carbon reporting system, to include scenario modelling and to optimise allowance purchase strategy, minimising costs to the business.
179. Data entered onto BRM+ is subject to a quality assurance check to validate the risks and potential outputs of any investment. Solutions and failure scenarios have been validated by the Investment Planning Team, as well as the relevant M&G Team. This has ensured the validity and consistency of all BRM+ entries within the system.
180. This area of investment was challenged at the Energy Strategy Group. This was to ensure consistency and quality and to avoid duplication. This took place prior to the AMP5 Steering Group challenge process detailed in section 9.1.9.

1.2.8.4. Analysis

1.2.8.4.1. Comparison of Historic Forecast Activity and Expenditure

181. Table 18 below identifies the historic investment in Carbon assets:

Investment Area	Actual Expenditure		Proposed	Net Benefit
	AMP3 £m	AMP4 £m	AMP5 £m	£m
Carbon	0.0	0.0	2.14	11.16

Table 18: Carbon Historical Expenditure Table

- ⦿ No investment was proposed for this area in AMP3 or AMP4.
- ⦿ AMP5 proposed areas of investment are Energy Efficiency and Carbon Management.

1.2.8.4.2. Comparative Analysis

182. Scheme costs for carbon were developed as part of the Arup options analysis in conjunction with experts both within the business and at Arup using their national industry experience. They were refined with reference to previous studies on energy efficiency and energy management (Optima development).

1.2.8.4.3. Estimate of capex and opex of interventions

183. Table 19 below shows the proposed carbon scheme costs (capex and operating costs saved).

PR09 Schemes with Energy Benefit		
Scheme Name	Capex	Opex (annual, by end of AMP)
	Capex £m	Opex FYE £k
Wider SCADA use	0.840	-180
EBU motors and gearboxes	1.032	-300
Integrated Carbon Management System	0.270	0
Total	2.142	-480

Table 19: Carbon Schemes with Energy Benefits

184. All energy savings are 100% within the boundary of the site.

1.2.8.4.4. Stakeholder support

185. Yorkshire Water's EAP has had significant involvement in the development & prioritisation of AMP5 schemes. It has shown unanimous and strong

support for the carbon reduction projects listed. Energy efficiency and carbon management are viewed as essential investment.

1.2.9. *Biodiversity*

1.2.9.1. *Challenges from OFWAT between DBP and FBP and changes to the plan*

186. We have transferred our scheme for Ancient Woodland Management and an investigation into the provision of a fish pass at Rodley Weir on the River Aire into Part B4 on the basis that it has support from the EA and the other reasons as set out in Part B4. This is a reduction of £1.923m. For commentary on these schemes, please see Part B4 section 1.11.6.3.
187. We were asked to perform some additional benefits assessments for biodiversity. The biodiversity schemes benefits have been assessed using the capital and operational impacts for the solutions and the carbon impacts to build, maintain and operate the assets. The benefits included are specific to the scheme and are detailed below.
188. The benefits for the fish pass and river restoration schemes are based on the length of river that will be improved as a result of the scheme. This analysis uses the 'Willingness to Pay' (WTP) data collected for river water quality as part of the Company survey in 2007. The length of river improved is based on the scheme proposal for the river restoration scheme and the fish pass schemes are assumed to be the same as the fish pass at Rodley proposed with our quality programme. These schemes have been assessed as cost beneficial.
189. The biodiversity scheme is reliant on proposals from stakeholders for enhancing biodiversity. Any schemes proposed will be assessed and prioritised using cost benefit analysis. As these schemes are not yet fully defined the assessment has been based on past similar schemes that have been undertaken as part of our landfill tax credits scheme. Two schemes under the landfill tax credits have been assessed using the site area and the relevant values for the relevant land type from the DEFRA report 'Framework for Environmental Accounts for agriculture (Eftec, 2004). The benefits presented are based on an average benefit of the schemes assessed per pound of capital expenditure. The actual value is a proportional benefit value, relative to the capital expenditure. This scheme has been assessed as cost beneficial.

1.2.9.2. *Introduction*

190. A Biodiversity Action Plan has been developed. This allows us to understand the impact of our activities on biodiversity and take steps to mitigate any negative impacts of our operations on the environment,

specifically on sensitive flora and fauna. The schemes proposed for PR09 take this further. They will deliver tangible biodiversity improvements on or adjacent to our sites, demonstrate compliance with key legislation in this area and protect customer interests for AMP6.

191. There are a number of drivers for the investment we have outlined under biodiversity:

- ⦿ Meeting our duties under the Natural Environment and Rural Communities (NERC) Act 2006 (Part 3 Section 40 – Duty to conserve biodiversity): (1) Every public body must, in exercising its functions, have regard, so far as is consistent with the proper exercise of its functions, to the purpose of conserving biodiversity. (3) Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population.
- ⦿ Informing AMP6 decisions on WFD investment, through the evaluation of the cost-benefit of ‘softer engineering solutions’, defending our customers against disproportionate and / or poor value investment decision making.
- ⦿ Supporting the delivery of national and regional biodiversity strategies and targets and delivering biodiversity improvements on or adjacent to our land.
- ⦿ Ensuring we take a long-term, sustainable investment perspective to achieve our vision and support our SDS.
- ⦿ Leverage the expertise and resources of the organisations represented on our independent EAP (made up of around 25 key environmental stakeholders including the EA, Natural England, RSPB and the Yorkshire Wildlife Trust), key stakeholders and regulators
- ⦿ Meeting regulatory guidance:
 - DEFRA’s Statement of Obligations states Water Companies must take steps to support the conservation of UK priority species and habitats.
 - DEFRA’s Social and Environmental Guidance states that “Ofwat is expected to consider statutory duties on all public bodies to have regard to SSSIs & biodiversity conservation in its functions”
 - DEFRA’s Social and Environmental Guidance states that “where the benefits to water customers from measures to reduce treatment costs exceed the costs of the scheme these should be considered by Ofwat”

1.2.9.2.1. *Business Requirements*

192. Biodiversity investment was promoted on the following basis:
193. Compliance+
- ⦿ Yorkshire Water has biodiversity duties under the Water Industry Act (WIA) 1991, The Countryside and Rights of Way (CROW) Act 2000 and the more recent Natural Environment and Rural Communities (NERC) Act 2006.
 - ⦿ The broad requirement of all three duties is to integrate biodiversity into the delivery of the Company's functions, with the more recent NERC Act requiring the following:(1) Every public body must, in exercising its functions, have regard, so far as is consistent with the proper exercise of its functions, to the purpose of conserving biodiversity. (3) Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population.
 - ⦿ These schemes enable the practical implementation of our duties under the NERC Act in areas identified as most cost-beneficial by our EAP. They also help meet our compliance+ vision to 'Proactively conserve and enhance the environment' and 'Go beyond compliance where the benefits exceed the cost'; delivering significant environmental benefits; contributing to national and regional biodiversity objectives and enhancing the biodiversity of the Yorkshire region.
194. Partners
- ⦿ There is a good opportunity to work with a number of our partners on these initiatives, leverage their resources in this area and share learning to drive further improvements.
195. Society
- ⦿ These schemes enhance our reputation and relationships with key stakeholders. Biodiversity was identified as one of the top priority environmental issues recognised by our EAP for PR09. These schemes have been developed, challenged and prioritised on a number of occasions by our EAP. They represent the minimum investment that we and our EAP feel is needed to meet our AMP5 duties in relation to biodiversity. There is likely to be both regional and national media interest in these activities and society will see clear benefits within the region.

196. Value+

- Two of the schemes aim to deliver ‘cost avoidance’ through investigating more sustainable and cost effective ways to improve ecology and water quality in rivers and inform investment in AMP6 required to deliver the WFD.

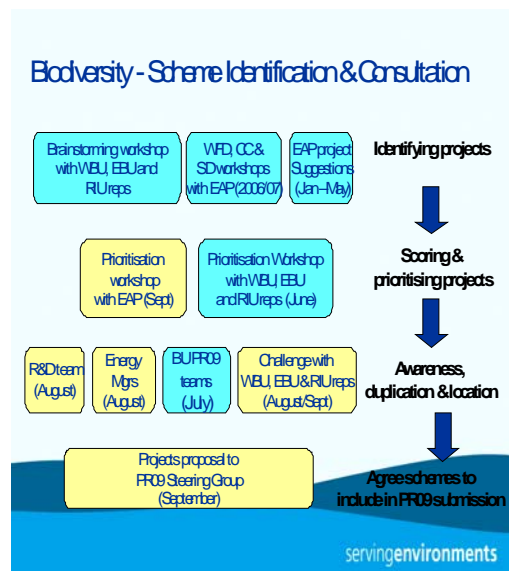
197. People+

- Employees will benefit from a number of these schemes, both within work, through biodiversity improvements on sites, to outside work, seeing biodiversity improvements in their local vicinity. This will help Yorkshire Water to be seen as a great company to work for and a great place to work.

1.2.9.3. Data

1.2.9.3.1. Service and Asset Performance Observations

198. A number of brainstorming sessions were held across the business to collate initial ideas on possible projects. A number of workshops were also held with our EAP, which focused on the WFD and sustainable development and identified a number of possible projects. Initially over 60 projects were identified across a number of environmental areas.



199. A number of challenge sessions were held to greatly refine the projects. Projects which were better placed within other areas of the programme were removed from this list and transferred to other relevant areas, including R&D, WFD investigations and Land and Planning, to avoid duplication.

Figure 21: Biodiversity Scheme Identification and Consultation Diagram

1.2.10. Verification and Validation Process

200. A prioritisation workshop was held with our EAP to agree a set of criteria to score the costs and benefits of each project and plot them on a matrix to identify the most cost-beneficial. The criteria included links to the Yorkshire Water vision and environmental policy, opportunities for partnership

working, delivery of ecosystem benefits and alignment with key legislation and regional strategy. Our EAP provided their views on which of the projects they considered to be of highest priority in delivering most environmental benefit. A shortlist of projects was then produced using this information which has been entered into BRM+.

201. Cross referencing was undertaken with the research and development, land and planning, Environmental & Catchment and WFD sections of the business to ensure no duplication. Expert review was sought and we revisited this with EAP to ensure our proposal were in line with stakeholder views. The end result of this eighteen month substantial review, challenge and prioritisation process was the three biodiversity projects detailed below and those included within Part B4. These represent the minimum investment in this area required to deliver our biodiversity duties and significant biodiversity benefit. All these projects have been agreed with and are unanimously supported by our EAP.
202. The data was entered into BRM+ manually, for use in ELSA+ by each potential area of investment (listed below). For some of the areas of investment different scenarios of expenditure were entered. These were entered as lump sums in BRM+ with the Opex of Capex screen completed also. The failure scenarios used were Compliance +, Partners, People +, Society, Value +.
203. The three schemes proposed for investment are:
 - Biodiversity enhancements on / adjacent to Yorkshire Water land
 - River engineering to remove barriers to fish movement and inform the delivery of the WFD
 - River restoration and evaluation to inform the delivery of the WFD.
204. The outputs of these schemes are:
 - Cost-benefit assessment of 'softer' engineering solutions on river margins & in rivers to inform AMP6 investment decisions & influence the action of others
 - Removal of barrier to fish passage on three weirs
 - Delivery of biodiversity benefits for the region through work on or adjacent to our sites.
205. Data entered onto BRM+ is subject to a quality assurance check to validate the risks and potential outputs of any investment. Solutions and failure scenarios have been validated by the Investment Planning Team, as well as the relevant M&G Team. This has ensured the validity and consistency of all BRM+ entries within the system.

206. This area of investment was challenged to ensure consistency through the AMP5 Steering Group challenge process detailed in section 9.1.9.

1.2.10.1. *Analysis*

1.2.10.1.1. *Comparison of Historic Forecast Activity and Expenditure*

207. Table 20 below identifies the historic investment in biodiversity assets:

Investment Area	Actual Expenditure		Proposed	Net Benefit
	AMP3 £m	AMP4 £m	AMP5 £m	£m
Biodiversity	0.0	0.0	2.79	10.58

Table 20: Biodiversity Historical Expenditure

- o No investment was proposed specifically for biodiversity in AMP3 and AMP4 but significant environmental gains were made through investments in the Quality programme.
- o AMP5 investment proposed includes biodiversity enhancements on or adjacent to Yorkshire Water land management work to inform the delivery of WFD.

1.2.10.1.2. *Comparative Analysis*

208. Due to the emergent nature of this area of work, there was no cost data available from previous AMPs. Instead scheme costs for biodiversity were developed in a number of different ways depending on the information available as follows:

- o Biodiversity enhancement costs were developed using knowledge of similar projects that have previously been funded under the Landfill Tax Credit scheme.
- o River restoration costs were obtained from the National River Restoration Centre and based on a similar study underway in the south of England.
- o Sampling costs were developed through past experience of water quality sampling costs and information from 'Recommendations for future TLL monitoring (2003-4 & 2005-10)' report, commissioned by YW in 2003 and based on EA monitoring costs.

1.2.10.1.3. *Stakeholder Support*

209. Yorkshire Water's EAP, comprised of 22 key stakeholders and chaired by the Regional Director of Natural England, has been greatly involved in the development and prioritisation of AMP5 schemes. It has given unanimous and strong support for the three projects listed, ranking these schemes at

the very top of their prioritised list. We will be working in partnership with members of our EAP in delivery of these projects and expect them to be leveraged both financially and intellectually so they should be even more beneficial than we are currently forecasting.

210. We have received significant support from a number of our key environmental stakeholders as the following quotes illustrate:

“Biodiversity projects provide an excellent opportunity for YW to work with others in partnership and achieve multiple benefits for the environment”

YorkshireDales Rivers Trust

“We are keen to work with YW and other partners in developing a number of the proposed biodiversity projects. The Ancient Woodlands and Biodiversity enhancement projects are particular examples of where there is a potential for partnership working that can bring added value.”

Groundwork Yorkshire & Humber

“These projects links to the WFD and tackling diffuse pollution as well as barriers in rivers and fit within the M4 measures.”

“Work to remove barriers to fish movement within rivers is extremely important in order to obtain the ecological benefits of improved water quality driven through YW’s £200m investment under the Freshwater Fish Directive, especially as migratory fish are now returning to all Yorkshire Rivers”.

(Aire & Calder Rivers Group)

“Natural England support the investigatory approach YW is taking to provide a basis for understanding and qualifying future work. The softer engineering schemes must include a monitoring programme in order to assess the effectiveness of this approach to inform AMP6 investment.”

Natural England

1.2.11. Accommodation

1.2.11.1. Challenges from OFWAT between DBP and FBP and changes to the plan

211. There are no changes to our accommodation submission between DBP and FBP

1.2.11.2. Introduction

212. The accommodation investment of the business includes the general facilities managed sites such as Buttershaw. These buildings are on operational sites but do not contain operational equipment such as site offices and depots. We have covered expenditure to maintain serviceability and meet operational requirements, including maintenance, extensions and landscaping.

1.2.11.2.1. Business Requirements

213. Accommodation investment was promoted on the following basis:

- ⦿ Accommodation strategy - Preservation and improvement of buildings and to provide adequate office accommodation for the business.
- ⦿ Health & Safety - Any Health & Safety risks on the buildings including Disability Discrimination Act (DDA).
- ⦿ People+ - This includes Yorkshire Water's Great Place to Work policy.

1.2.11.3. Data

1.2.11.3.1. Service and Asset Performance Observations

214. We identified the accommodation requirements for the business through studies i.e. the provision of new, replacement or modified buildings. We also included the preservation and improvement of buildings and land not in other categories.

215. The studies were one to one meetings with the key business users rather than a study group. The following activities were therefore carried out:

- ⦿ Buildings/accommodation review undertaken to determine requirements and specifications.
- ⦿ Condition grading of buildings and assets were undertaken by external consultants.



Figure 22 - Depot roof – AMP5 replacement

- o Internal surveys were carried out by consultants and remedial contractors.
- o Review of sites already identified for sale/new buildings required.

1.2.11.3.2. *Verification and Validation Process*

216. The data was entered into BRM+ for use in ELSA+ in annual blocks of expenditure for each building. For every solution block of expenditure there are 3 failure scenarios attributed, health & safety, people + and inability to provide office accommodation.

Buildings:

- o Western House
- o Buttershaw Depot
- o Midway
- o ROCC
- o Woodlands
- o Esholt Hall
- o Temple Park
- o Data Centre
- o Knostrop House
- o Knostrop Reception.

217. Data entered onto BRM+ is subject to a quality assurance check to validate the risks and potential outputs of any investment. Solutions and failure scenarios have been validated by the Investment Planning Team, as well as the relevant M&G team. This has ensured the validity and consistency of all BRM+ entries within the system.

1.2.11.4. *Analysis*

1.2.11.4.1. *Comparison of Historic Forecast Activity and Expenditure*

218. Table 21 below identifies the historic investment in Accommodation assets:

219. There is a reduction in AMP5 investment compared to historic because of the reduced need for further building construction and purchase for our employees.

Investment Area	Actual Expenditure		Proposed	Net Benefit
	AMP3 £m	AMP4 £m	AMP5 £m	£m
Accommodation	18.5	6.72	2.54	-3.14m

Table 21: Accommodation Historical Expenditure

- AMP3 investment consisted of building maintenance, EaWR and new buildings (Midway, Woodlands, Temple Park)
- AMP4 investment consisted of DDA, Health & Safety, “Great Place to Work”, EaWR, building maintenance and the new Datacentre building
- AMP5 will consist of DDA, Health & Safety, “Great Place to Work”, EaWR, building maintenance and depot roof replacement.



Figure 23: Scheme completed as part of DDA

220. The large spend in previous AMP periods has been for new buildings. AMP3 saw the construction of Midway, Woodlands (replacing Bradley) and Temple Park (replacing Harehills). In AMP4 the new Datacentre was built at Thornbury next to our Loop call centre. Investment for AMP5 does not include any new buildings and is made up of asset replacement and building maintenance.
221. These are captured in figure 24 below after following the 3 stage common framework assessment detailed in section 9.1.10.

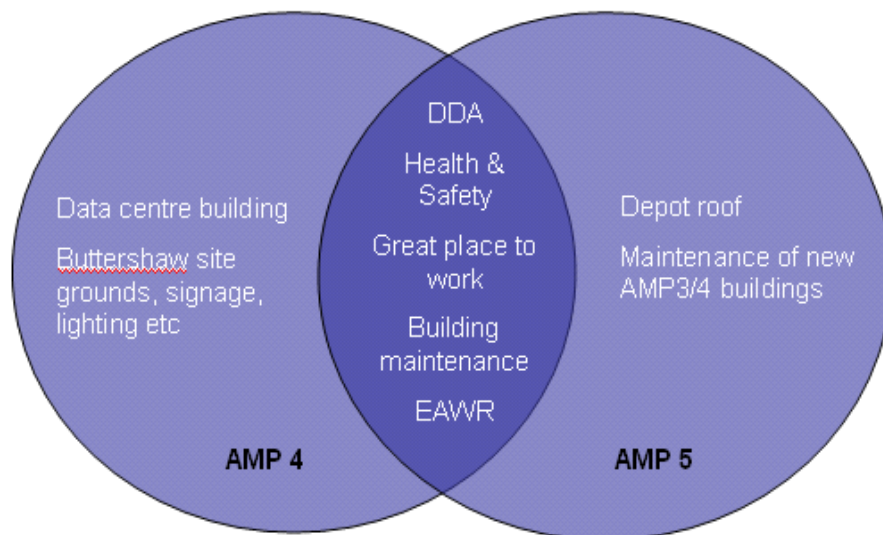


Figure 24: Accommodation Common Framework Representation

1.2.11.4.2. *Comparative Analysis*

222. The solution costs were provided on an annual basis as part of the survey work. This was based on the end of asset life of each separate building element e.g. roof, windows, external brickwork etc. Therefore each building solution cost was identified by element failure on an annual basis between 2010 and 2035. This information was captured on separate spreadsheets relating to each building and as such one solution/building/year was then entered into the BRM+ database.

1.2.12. *Asbestos remediation*

1.2.12.1. *Challenges from OFWAT between DBP and FBP and changes to the plan*

223. There are no changes to our asbestos remediation programme between DBP and FBP

1.2.12.2. *Introduction*

224. This programme contains the removal of and re inspection monitoring cycle of asbestos in Yorkshire Water operational and non operational buildings in the AMP5 period.
225. The survey work has been undertaken in four phases through AMP3 and AMP4. With the original surveys coming to an end we are looking now at where re-inspections will be needed against alternative mitigation and reduced operating costs.

1.2.12.2.1. *Business Requirements*

226. The asbestos monitoring and removal programme was promoted under a statutory obligation – CaWR 2006. The obligation requires us to identify areas of asbestos in operational and non operational buildings and make safe.
227. It requires us to ensure records are kept of asbestos whereabouts and action taken. It requires that persons are informed and necessary steps taken to avoid exposure. It also covers the need for repeat inspections (operational expenditure) on a 6 monthly and 3 yearly basis.
228. The programme of work was based on two main options. These were remedial work to make safe and associated repeat inspections to ensure compliance or total removal of asbestos meaning no further inspections are needed.
229. The AMP5 investment programme, as AMP4 is based on a mixture of capital work for remedial activity and repeat inspections.

1.2.12.3. Data

1.2.12.3.1. Service and Asset Performance Observations

230. The initial asbestos projects in AMP3 and 4 identified 3,475 assets requiring to be surveyed for asbestos. Once surveyed either remedial works were undertaken to remove or make safe asbestos or sites were classified for an ongoing monitoring regime.
231. The CaWR legislation came into force in 2002 with amendments made in 2006 which put more of an emphasis on the duty to monitor and manage asbestos risks.
232. A four phase strategy was approved in 2005 as follows:
- Phase 1 – AMP3 pilot study at 46 sites (completed)
 - Phase 2 – Accelerated AMP4 schemes at further 53 sites (completed)
 - Phase 3 – AMP4 Surveys at 943 sites + any remedial works + re inspections of phase 1 + 2 (completed)
 - Phase 4 – AMP4 survey of remaining 2,375 sites (to be completed by 2009).
233. Sites were prioritised according to their potential risk. The project submission looks to address the future risk of exposure whilst reducing the opex financial obligation.

1.2.12.3.2. Verification and Validation Process

234. A single capex solution was created in BRM+ for Yr 1 of AMP5 which has been split 60% Water & 40% Environmental (based on previous expenditure profile). The solution shows an annual opex based on the 15 year payback period. Other BRM+ entries for other options were created for comparison. No data was input for remedial costs arising from re inspections. Failure scenarios risk scored on failure to comply with legal obligations (CaWR2006) and Health & Safety (Risk).
235. Data entered onto BRM+ is subject to a quality assurance check to validate the risks and potential outputs of any investment. Solutions and failure scenarios have been validated by the Investment Planning Team, as well as the relevant M&G Team. This has ensured the validity and consistency of all BRM+ entries within the system.

1.2.12.4. Analysis

1.2.12.4.1. Comparison of Historic Forecast Activity and Expenditure

- 236. Table 22 below identifies the historic investment in Asbestos assets:
- 237. The reduction in AMP5 from AMP4 is largely due to all the survey work done in the previous AMP and limited spend on remedial work. The expenditure is mainly for re-inspection of sites.

Investment Area	Actual Expenditure		Proposed	Net Benefit
	AMP3 £m	AMP4 £m	AMP5 £m	£m
Asbestos	0.1	1.72	1.48	1.98

Table 22: Asbestos Historical Expenditure Table

- o AMP3 consisted of pilot survey investment.
 - o AMP4 consisted of investment for surveys, remedial work and re-inspections.
 - o AMP5 will consist of investment proposed for remedial work and re-inspections.
238. These are captured in figure 25 below after following the 3 stage common framework assessment detailed in section 9.1.10.

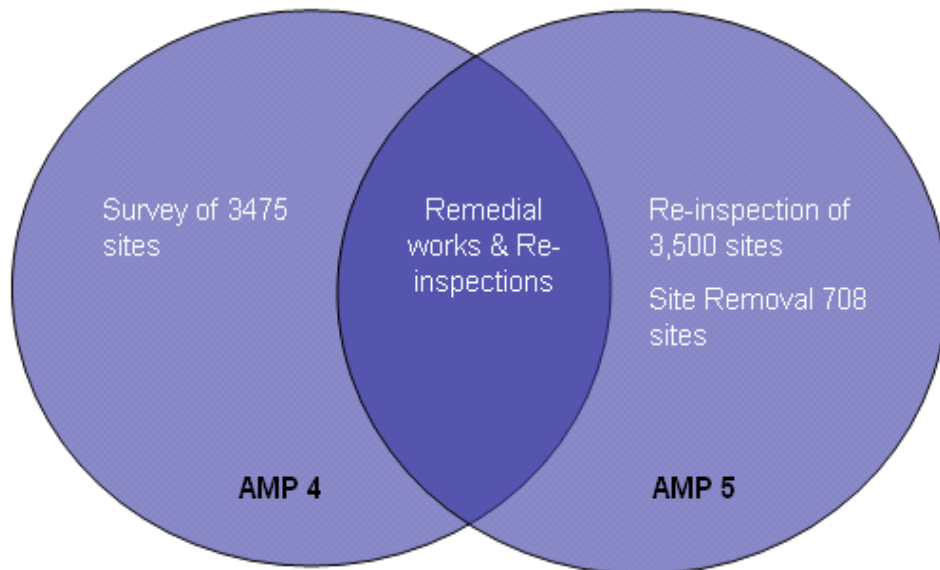


Figure 25: Asbestos Common Framework Representation

1.2.12.4.2. Comparative Analysis

- 239. A mixture of the consultants and remedial contractors actual cost data and estimated costs were used in the calculations of the options considered. Using actual cost data from phases 1-3 for removal and surveys the phase

4 predicted outturns were calculated to allow the full impact of all sites for the 5 possible options to be considered. The re inspection average cost was derived from the consultants limited actual data and estimated costs.

240. A full whole life cost and options appraisal was performed to help make a decision on the best option for removal / remedial / inspections. This is summarised in table 23 below:

	Option	Capex £m	40 year annual opex £m	Capex profile	Comments	Sites Removed
1	Nothing	0.0	0.43	1 year	High opex, high risk	0
2	5 years	0.2	0.37	1 year	Low reduction in opex / risk / sites	163
3	10 years	0.9	0.31	1 year	Medium reduction in opex / risk / sites	456
4	15 years	1.48	0.26	1 year	Significant reduction in opex / risk / sites	708
5	Remove all	20.5	0.21	5 years	Includes possible demolition	1708

Table 23: Summary of Life Cost and Options Appraisal

241. The appraisal was based on the following figures, all based on historical analysis:

- Removal of asbestos through capital expenditure.
- Re-inspection average cost (opex) £500.
- Re-inspection payback periods of 5, 10 and 15 years.

242. The whole life cost analysis, pay-back period and benefits over concerns has told us that the 15 year option is the best option and forms the basis of the submission. We believe through this investment we will be compliant with the CaWR 2006 regulations and ensure the Health & Safety of our employees.

1.2.13. PR14

243. In the plan we have included £6.24m for work on preparing PR14. This is based on current and remaining forecast of costs to deliver our FBP submission. All of this expenditure is Solution Authorised at Board level and is detailed in table 24 below:

Project Code	Project Desc	lc Desc	Project Status Desc	Amp4 Forecast and Actual expenditure
B0300	AMP5 Investment Plan - Additional IAV resources	PR09 Preparation	Project Started	396,696.73
B2653	Assessment of Flood Risks to EBU Assets - Phase 1	PR09 Preparation	Completed	45,300
B2044	PR09 M&G Survey Work	PR09 Preparation	Project Started	6,332.40
B1088	AMP5 Investment Plan - CW Serviceability & Levels	M & G Other	Project Started	135,150.38
B1079	AMP5 Investment Plan - Serviceability - WW Infrs	M & G Other	Project Started	344,984.82
B0656	AMP5 Investment Plan - CW Quality	M & G Other	Project Started	264,592.28
B0655	AMP5 Investment Plan - CW Serviceability & Levels	M & G Other	Project Started	650,484.09
B0654	AMP5 Investment Plan - CW Supply Demand	M & G Other	Project Started	356,640.98
B0497	Cost benefit assessment	M & G Other	Project Started	588,248.56
B0496	PR09 Project Management & Audit	M & G Other	Project Started	870,316.48
B0495	Financial and Economic Modelling	M & G Other	Project Started	378,584.68
B0471	AMP5 Investment Plan - WW Quality - Implication of	PR09 Preparation	Beneficially Completed	270,917.14
B0468	AMP5 Investment Plan - WW Serviceability & Levels	PR09 Preparation	Project Started	935,456.00
B0467	AMP5 Investment Plan - WW Quality & Supply Demand	PR09 Preparation	Project Started	837,096.75
B2790	Update of SIMCAT Models to GIS Format	PR09 Preparation	Commercial Completion	60,300
B2883	Cost Base Support (DBP to FBP)	PR09 Preparation	Project Started	100,000
			TOTAL	6,241,101.29

Table 24: PR14 expenditure projections

244. The allocation for PR14 in the plan is directly attributable to our current forecast for delivering PR09. If we continue to streamline our LEADA processes, systems and data collection and integrate them to become 'Business as Usual', we would plan to reduce our costs for delivery of PR14.

Investment Area	Actual Expenditure		Proposed
	AMP3 £m	AMP4 £m	AMP5 £m
PR14	0	6.24	6.24

Table 25: PR14 expenditure projection

1.2.14. Access and Recreation

1.2.14.1. Challenges from OFWAT between DBP and FBP and changes to the plan

245. We have transferred the access and recreation expenditure from Water service Part B3 section 3 to M&G for FBP. This was in response to a recommendation by our Reporter who stated they would prefer to the expenditure in its historical location.
246. Ofwat had a number of challenges on our DBP submission for this expenditure area, these are summarised below:

247. To maintain the asset base the value of the programme is £2.5m (AMP4 £1.8m). Some areas of work e.g. boundaries and roads were not included in the AMP 4 program and an uplift is required in AMP5. For the FBP an additional £2.5m is included to meet increasing recreational customer demand at our sites and to address the deterioration of toilet blocks, car parks, boundaries and access roads. This will address a shortfall of capital maintenance in AMP4.
248. The need for investment is based on a comprehensive assessment of asset deterioration. A detailed recent examination was undertaken on the condition of access roads, recreational routes (including routes for disabled, walkers, equestrians, cyclists etc) car parks, boundaries and toilet block facilities.
249. The FBP is based on maintaining existing assets in a safe condition for current levels of use. It will enable us to continue to meet the requirements of the Water Industry Act, DDA and provide facilities to meet an increase in demand on our recreational sites, particularly for toilet provision and car parking. Currently demand exceeds provision. Some areas of this plan have not received investment in other business plan periods.
250. The condition of the assets demonstrates an increase in use and in visitor numbers. The increased use and declining condition of the assets restricts the ability to meet current and future demand.



Figure 26: Asset deterioration at recreational sites

251. Access to the water catchment lands and the impact of CRoW has been assessed. Where access is now available it is forecast that 25% of the assets will be require investment over the business plan period.

1.2.14.2. Introduction

252. The expenditure in this driver is for the provision and maintenance of public facilities at our impounding reservoirs.

1.2.14.2.1. Business Requirements

253. The output of the project charter detailed expenditure requirements to maintain serviceability of our access and recreation assets.
254. Analysis of the consultation with stakeholders and customers allows us to take a pragmatic approach to access and recreation and is used to inform the investment in AMP5. For example, it was found that customers would like to see maintenance of car parks, roadways and pathways to allow access to our reservoirs and countryside.
255. The projects are listed by the main driver for their completion, typically Health & Safety and compliance with legal obligations. The study considered three main types of investment:
256. Projects to maintain current assets and meet the Water Industry Act 1991 – Codes of Practice for Conservation, Access & Recreation.
257. Projects to ensure that we meet the anticipated growth in demand in the AMP5 period and provide the same level of service to customers, meeting the codes of practice described above.
258. Other drivers of this investment are;
- o Protection of Water quality
 - o Health & Safety - Public Safety & Claims
 - o Meet the requirement of Water Ind Act 1991 & Code Of Practice, W&C Act, DDA, CRoW, FSC
 - o Contribution to biodiversity strategy - habitats and species
 - o YWS Vision - 'delight' - Clearly The Best' & media
 - o Partnerships - community liaison, supporting, joint project
259. The investment will deliver part of the Yorkshire Water vision and meet the statutory duties under the Water Industries Act 1991, its code of Practice on Conservation, Access and Recreation, the Countryside Rights of Way Act 2000, the DDA and legal requirements of contracts developed with the Forestry Commission under the Forestry Strategy for England 1998. Deliver the Supersites Strategy based on the Washburn Valley pilot and Langsett woods site.

1.2.14.3. Data

1.2.14.3.1. *Service and Asset Performance Observations*

- 260. Demand on recreation facilities by customers has meant that maintaining the level of service requires increasing investment.
- 261. Based on the outputs of the asset survey it is proposed that £5.05m is spent in AMP5 to continue maintaining access and serviceability.
- 262. This consists £2.5m to maintain our current assets as they are and a further £2.5m to account for an increasing number of visitors to our sites in AMP5 and beyond.
- 263. We consider this expenditure to be maintaining the level of service to the customer. Without investment serviceability will deteriorate. Facilities will be inadequate and lack capacity to meet demand.
- 264. This service is a statutory requirement and hence this expenditure is required.

1.2.14.3.2. *Verification and Validation Process*

1.2.14.4. *Analysis*

1.2.14.4.1. *Comparison of Historic Forecast Activity and Expenditure*

Investment Area	Actual Expenditure		Proposed
	AMP3 £m	AMP4 £m	AMP5 £m
Access & Recreation	0	1.77	5.05

Table 26: Access and recreation expenditure table

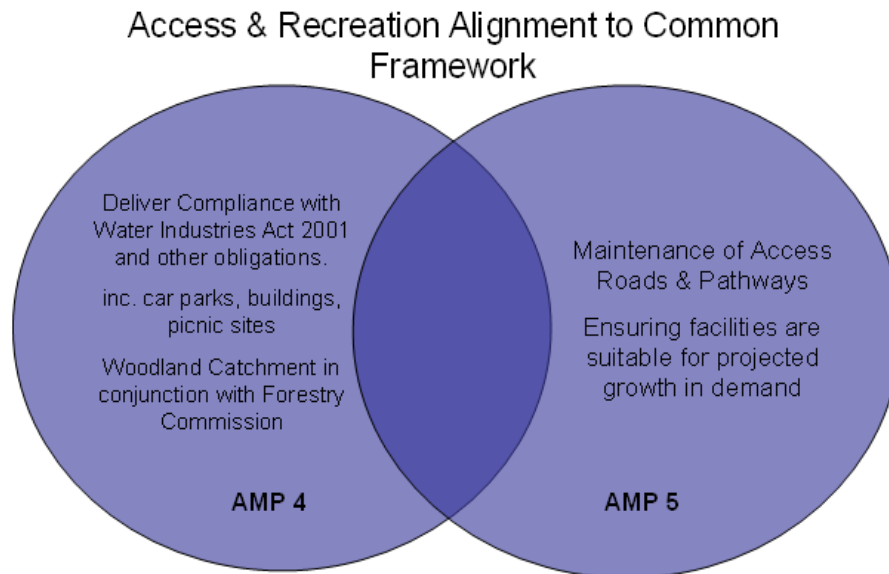


Figure 27: Access and Recreation - Common Framework Representation

1.2.14.4.2. Comparative Analysis

- o In AMP3 there was no expenditure for access and recreation
- o In Amp4 we spent £1.77m on facilities. An increase in demand means that we have seen a deterioration of facilities in AMP4.
- o Our AMP5 proposal is to maintain car parks, roadways and pathways to allow access to our reservoirs and countryside.
- o The AMP 5 programme is a prioritised programme of investment to provide recreation for our customers.

265. The costs are based on the condition, need and assessment to meet the legal requirement and Health & Safety standards. Costs have been achieved from AMP 4 true costs, consultant surveys and cost modelling to meet the period 2010-15.

266. The AMP5 investment programme was built up by:

- o Reviewing the AMP 4 problem and needs register.
- o A condition and fit for purpose review of existing engineered recreational assets.
- o A condition and fit for purpose review of a key Yorkshire Water web site promoted routes with a sample and extrapolation for others.
- o Review of existing access provision in terms of effectiveness, any new demands, the impact of customer use on CRoW open access land and none web promoted routes.

- Liaison with network users and managers and a review of serviceability of permissive and definitive routes.
- Reviewing opportunities to deliver improved access for specialist user groups and resolve conflict where it occurs.
- Review Yorkshire Water public safety database, identified risks and strategy for public safety at site.
- Development of Supersites and delivery of the recreation Supersite Strategy.
- Develop costs to implement the detailed programs contained within the forestry design and management plans.
- The use of specialist consultant to support the process, advice in specialist areas and develop costs.

267. Below is a list of list of sites and planned work that forms the content of this programme

Recreation & Woodland AMP 5 Capital Investment Prioritisation

Site Name/ Location	Recreation Asset Type	Recreation Strategy Site Category - post AMP 5 development	Project/ Task Type	Units- 1000m	Units - 1000m2	Unit Each	NOTES/ISSUES
Swinsty	Path	Gateway	New	0.4			400m path from res. to Fewston Church to DDA standard. YWS commitment to Church Heritage project and community liaison/support for mutually beneficial projects
Underbank	Path	Recreation	New	1.8			To meet demand and increase access to YWS Land. Path along res. to A616 side, litter/dumping/poor verge management to a A616 side. Car park reduce size?, protect wood from dumping/damage, create official cycle/bridle route to Midhopestone – Stocksbridge.
Ingbirchworth	Path	Adventurer	Refurbish	2			Res. circular path. Deteriorating condition and H&S and meet demand. PC issues to address
East Ardsley	Path	Recreation	Refurbish	2.5			circular res, Path erosion, H&S, customer concern and re-occurring issues
Redmires	Path	Adventurer	Refurbish	2.7			circular res, address erosion issues
Redmires	Path	Adventurer	Refurbish	2.5			Catchwater track and path, DDA promoted, address uses and fit for purpose
Damflask	Path	Recreation	Refurbish	4.3			Circular path condition and H&S and meet demand, refit and veg, drain management
Damflask	Path	Recreation	Refurbish	0.7			Path via Ughill ponds creating link routes address use and erosion issues

Site Name/ Location	Recreation Asset Type	Recreation Strategy Site Category - post AMP 5 development	Project/ Task Type	Units- 1000m	Units - 1000m2	Unit Each	NOTES/ISSUES
Blackmoorfoot	Path	Recreation	Refurbish	1.2			Circular path condition and H&S and meet demand, refit and veg, drain management
More Hall	Path	Recreation	New	1.9			South path poor condition and H&S and meet demand, refit and veg, drain management,
Scout Dike	Path	Recreation	Refurbish	1.5			Circular Path to complete erosion, H&S, current wildlife impacts to resolve
Scout Dike	Path	Recreation	New	0.4			Create recreational ops and link paths to Royd Moores creating useful circular and link routes
Royd Moor	Path	Explorer	New	2.3			Create circular path & recreational ops and link paths, route currently being used and impacting on habitats
Thruscross	Path	Gateway	Refurbish	2.7			Link path from ThrursX to Blubberhouses poor and H&S and meet demand, refit and veg, drain management, partners with BCU and WWAG, Check bridges and path around res, some starting to rot in AMP4
Warley moor	Path	Adventurer	Refurbish				Oxenhope Moor, Ford/stream crossing, Joint project with Brad MC to address safety issues
Scammonden	Path	Gateway	Refurbish	8.5			Link routes and refurbish routes to meet 'gateway' status, address local and YWS expectations
Tophill low Path	Path	Gateway	Refurbish	3			Refurb. of paths around D&C res to easy access standard & access to hides
Baitings	Path	Explorer	Refurbish	1.8			Refurbish soil path, drainage, erosion issues
Underbank	Cycle	Recreation	New	1.8			From Stocksbridge to Midhopestones - linking routes and manage current 'taken access', support activity centre
Langsett	Cycle	Gateway	New	5			Single Track/North shore dedicated cycle area, To create new opportunities for cycle sports on YWS land
Fewston	Cycle	Gateway	Refurbish	3			Address issues of use, H&S & erosion, Timble Ings
Fewston	Equestrian	Gateway	Refurbish	3			Address issues of use, H&S & erosion, Timble Ings
Scammonden	Cycle	Gateway	New	5			Link routes and new routes to meet 'gateway' status, and north shore opportunities
Scammonden	Equestrian	Gateway	New	3			Link routes and new routes to meet 'gateway' status
Brayton Barff	Equestrian	Recreation	New	0.5			Bridleway link route to develop to manage use, liaison with East Yorks PROW team

Site Name/ Location	Recreation Asset Type	Recreation Strategy Site Category - post AMP 5 development	Project/ Task Type	Units- 1000m	Units - 1000m2	Unit Each	NOTES/ISSUES
Langsett	Equestrian	Gateway	Refurbish	3.5			North America PROW bridleway links to Mickelden edge in partnership with Moor 4 the Future, route part YWS ownership
Digley	Path	Recreation	Refurbish	11			Wessenden Moor PROW refurbishment and erosion control in partnership with Moor 4 the Future
Langsett	Path	Gateway	Refurbish	?			Requested by Moor 4 the Future to address issues, info needed for locations and issues
Cod Beck	Car park	Recreation	New		2.5		Summer car park to meet demands raised by PSG & police, to manage traffic and visitor issues
Inbirchworth	Car park	Explorer	New		1.3		Address issues of car park only on road and verges raised PC issues
Damflask	Car park	Recreation	New		2.5		Address issues of car park only on road and verges raised PC issues, pull in lay-by at plantation & support PC in Bradfield on YWS leased land
Widdop	Car park	Adventurer	Refurbish		0.8		Poor quality facility, Address quality and safety issues
Langsett	Car park	Gateway	New		7.5		Barn CP Capacity exceeded on many occasions Customer experience & traffic safety issues, equestrian use
Langsett	Car park	Gateway	Refurbish		1.7		Flouch CP, Refit and surface, landscape Deteriorating condition and H&S. Customer issues to address Surface, vegetation management, boundary repair, access across road, height barrier renewal
Ryburn	Car park	Explorer	Refurbish		0.6		Refit and surface, landscape, Deteriorating condition and H&S. Customer issues to address Surface, vegetation management, step repair, boundary repair, access road repair
Embsay	Car park	Recreation	Refurbish		2.1		Refit and surface, landscape, Address quality and safety issues
Grimwith	Car park	Recreation	Refurbish		5.6		Refit and surface, landscape Address quality and safety issues re-landscape, picnic tables, trees, shrubs, car park surface, info panels, DDA car parking.
Scar House	Car park	Recreation	Refurbish		3.5		Refit and surface, landscape, Address quality and safety issues - refit and surface, trees/shrubs poor growth, picnic tables, protection of historical context

Site Name/ Location	Recreation Asset Type	Recreation Strategy Site Category - post AMP 5 development	Project/ Task Type	Units- 1000m	Units - 1000m2	Unit Each	NOTES/ISSUES
Baitings	Car park	Explorer	Refurbish		0.8		Embankment CP, Refit and surface, landscape, Address quality and safety issues new fence, steps, surface and white line, height barrier, abseil issues?
Baitings	Car park	Explorer	Refurbish		1		Heights Cp, Refit and surface, landscape, Address quality and safety issues boundary renewal, surface and white line, height barrier.
Boothwood	Car park	Recreation	Refurbish		1.2		Refit and surface, landscape, Address quality and safety issues - landscape, fencing, management of 'escaping' landscape plantings, remove vegetation screening
Digley	Car park	Recreation	Refurbish		2.3		Quarry CP, Refit and surface, redesign & landscape, Address quality and safety issues, and poor car circulation and space - tree planting, landscape, height barrier, info board, picnic sites
Digley	Car park	Recreation	Refurbish		0.7		South cp, Refit and surface, landscape, Address quality and safety issues - boundary management access to footpaths
Yateholm	Car park	Explorer	Refurbish		1.1		Holme Moss, Refit and surface, landscape, Address quality and safety issues - boundary management to moor, inter board replace, protected view point
Ramsden	Car park	Explorer	Refurbish		0.6		Refit and surface, landscape, Address quality and safety issues - stream feature repair, picnic tables, tree management
Scammonden	Car park	Gateway	Refurbish		0.7		Crull moor, Refit and surface, landscape, Address quality, safety issues & boundary management - Refit or close?
Scammonden	Car park	Gateway	Refurbish		1.4		New Lane CP, Refit and surface, landscape, Address quality and safety issues - Surface, picnic sites, boundary removal/repair, vegetation management, expansion of area
Scammonden	Car park	Gateway	Refurbish		3.2		Wood Edge, Refit and surface, landscape, Address quality and safety issues - full refit, toilet block?, picnic site, better link paths.
Scammonden	Car park	Gateway	Refurbish		0.5		Sledge gate, Refit and surface, landscape, Address quality and safety issues - full refit, better link paths, design of parking, boundary repair

Site Name/ Location	Recreation Asset Type	Recreation Strategy Site Category - post AMP 5 development	Project/ Task Type	Units- 1000m	Units - 1000m2	Unit Each	NOTES/ISSUES
Brayton Barff	Car park	Recreation	Refurbish		1		Refit and surface, landscape, Address quality and safety issues - full refit, better link paths, design of parking, boundary repair, community notice boards, expand capacity
Rivelin	Car park	Explorer	Refurbish		1		Address quality and safety issues of lose stone surface
Scout Dike	Car park	Recreation	Refurbish		2.8		Address quality and safety issues of lose stone surface, veg management, picnic sites, view point, steps, community notice board
Underbank	Car park	Recreation	Refurbish		1.6		Anti-social issues, size reduction Address issues and consider use and size
Fewston	Car park	Gateway	New		1.5		Address issues of car park on road and verges and under capacity on busy days
Winscar	Car park	Recreation	Refurbish		2.9		Broad Hill, Refit and surface, landscape, CP surface to repair, Picnic site/duck feeding/car parking viewing water points to fit, protect open ground, height barrier?, Lay by on Dunford/Harden road tipping and damage to YWS land to resolve,
Winscar	Car park	Recreation	Refurbish		1		Windleden Land, Refit and surface, landscape, surface car park, expand car park, Plantations and boundary fence and tree review and remove/replace, Links to CROW land/Trans Pennine Trail, picnic site/benches supply.
Eccup	Car park	Recreation	New		0.8		Address requests to view kites and SSSI by less able people
Winscar	Toilets	Recreation	Refurbish			1	Refurb/demolish, Empty building to resolve, rebuild/sale/demolish
Scar House	Toilets	Recreation	Refurbish			1	refit/refurb, old fitting needs modernising with water, energy saving fittings and electronic closing mechanism
Scar House	Toilets	Recreation	Refurbish			1	Refurb/demolish/sell/new use, Empty building to resolve.
Grimwith	Toilets	Recreation	Refurbish			1	refit/refurb, Old fitting needs modernising with water, energy saving fittings and electronic closing mechanism
Fewston	Toilets	Gateway	New			1	New build, current facility unable to cope with use with limited capacity
Damflask	Toilets	Recreation	New			1	Toilet Block to build, High usage site lacking facilities, PDNPA and PC concern over lack of provision
Scammonden	Toilets	Gateway	New			1	Toilet Block to build, high usage site lacking facilities
More Hall	Toilets	Recreation	New			1	Toilet Block to build, High usage site lacking facilities

Site Name/ Location	Recreation Asset Type	Recreation Strategy Site Category - post AMP 5 development	Project/ Task Type	Units- 1000m	Units - 1000m2	Unit Each	NOTES/ISSUES
Tophill Low	Toilets	Gateway	New			1	New toilet block, Current poor condition, poor customer service
Tophill Low	Bird Hide	Gateway	Refurbish			12	Bird hide safety Audit, maintain safety of current structures, refit and rebuild
Tophill Low	Bird Hide	Gateway	New			4	Bird Hide, Improve visitor experience, safety, and address reducing quality, 'gateway' status
Tophill Low	Wildlife centre	Gateway	Refurbish			1	Wildlife Centre, Refit/demolish, old out of date displays, deteriorating condition, renew key facilities elsewhere
Tophill Low	Stores	Gateway	Refurbish			1	Storage garages, refit as quality store and public loos and covered outside exhibition space, Replace wildlife centre key facilities, improve security and visitor quality
Gouthwaite	Bird Hide	Recreation	Refurbish			3	Refit - screens, observation points, road access sight lines, specialist binocular rests etc, resolve current poor condition & poor customer service
Redmires	Bird Hide	Adventurer	Refurbish			1	Refit/demolish, current poor condition, poor customer service - Bird hide abused by non birding people
Scar House	Bunk House	Recreation	Refurbish			1	Paint, repair weather worn structure
Scar House	Shelters	Recreation	Refurbish			3	walkers shelters x3 refit and repair, damaged roof, deteriorating condition, Paint and refit, repair damaged roofs/gates/seats, Do we need them?
Regional Permissive	Footpaths	All	Refurbish			4	25% refurbishment of current provision and opportunities. Development and expansion of opportunities. Meet the recreation program/strategy where not listed specifically
Regional Permissive	Cycle	All	Refurbish			4	25% refurbishment of current provision and opportunities. Development and expansion of opportunities. Meet the recreation program/strategy where not listed specifically
Regional Permissive	Equestrian/cycle	All	Refurbish			4	25% refurbishment of current provision and opportunities. Development and expansion of opportunities. Meet the recreation program/strategy where not listed specifically
Regional	Boundaries	All	Refurbish				Repair/rebuild/refit external and internal key boundaries, Security and protection of site being lost, H&S issues arising, perception of ownership poor

Site Name/ Location	Recreation Asset Type	Recreation Strategy Site Category - post AMP 5 development	Project/ Task Type	Units- 1000m	Units - 1000m2	Unit Each	NOTES/ISSUES
Eccup	Boundaries	Recreational	Refurbish	2.9			Boundary fence to southern shore refit, derierating quality, maintain secure SSSI, manage hedge and opportunities for observation.
Brayton Barff	Boundaries	Recreational	Refurbish	0.6			Address issues f illegal access and tipping in the woodland, Protect woods from abuse, cycle, m/cycle, negative impact on semi-natural ancient woodland site. Protect wood from tipping, m/cycles, boundary damage.
Regional	Access roads						
Grimwith	Access road	Recreational	Refurbish	1.8			Refit surface and repair to cattle grids to access road. H&S, claims, public perception risks
Scar House	Access road	Recreational	Refurbish	6.5			Refit surface and repair, drainage to access road. H&S, claims, public perception risks
More Hall	Access road	Recreational	Refurbish	2.4			Refit surface and repair, drainage to access road. H&S, claims, public perception risks
Winscar	Access road	Recreational	Refurbish	1.1			refit, surface and repair, drainage to access road. H&S, claims, public perception risks
Scammonden	Access road	Gateway	Refurbish	0.5			Refit, Sailing centre, surface and repair, drainage to access road. H&S, claims, public perception risks
Ryburn	Access road	Explorer	Refurbish	0.2			Surface and repair, drainage to access road. H&S, claims, public perception risks
B'M'foot	Access road	Recreational	Refurbish	0.8			Surface and repair, drainage to access road. H&S, claims, public perception risks
Dallowgill	Access road	Adventurer	Refurbish	0.5			Surface and repair, drainage to access road. H&S, claims, public perception risks
Scargill	Access road	Explorer	Refurbish	2.8			Surface and repair, drainage to access road. H&S, claims, public perception risks
Eccup	Access road	Recreational	Refurbish	0.8			Access to red kite viewing area
Tophill Low	Access road	Gateway	Refurbish	0.7			Access road within WTW boundary to CP
Regional	Access roads	all	Refurbish	49			refurbishment of tracks for operation security, fire protection, public use and risk reduction, tenant use
Regional	Woodland tracks	All	New	5			New tracks to access woodland areas currently not vehicle accessible, fire protection,
Regional	Woodland tracks	All	Refurbish	35			refurbishment of tracks for operation security, fire protection, public use and risk reduction, tenant use

Site Name/ Location	Recreation Asset Type	Recreation Strategy Site Category - post AMP 5 development	Project/ Task Type	Units- 1000m	Units - 1000m2	Unit Each	NOTES/ISSUES
Fewston	Fishery	Gateway	New				Fence against dogs, new warden/fishing office, bank management, boats, training and EA powers to manage illegal acts
Damflask	Fishery	Recreational	Refurbish				Covered ticket & information area, toilets, bank management, training and EA power to manage illegal acts
Regional	Woodland	All	Accreditati on		650		Management of woodlands to meet FSC management plans to sustain wildlife, biodiversity and water quality, manage plantations to reduce effects of windblown on operational and water quality and increase opps. for recreation and wildlife
Regional	Woodland PAWS	All	Accreditati on		50		Plantations on Ancient woodland Sites, essential management to protect and prevent decline. Requirement of FSC.
Regional	Woodland ASNW	All	Accreditati on		50		Ancient semi-natural woodland sites, essential management to protect and prevent decline. Requirement of FSC.
Tophill Low	Habitat	Gateway	Refurbish		120		Lagoons/Marshes, Habitat development to address the current water supply and WTW process, maintain quality of reserve and bird habitat, maintain and enhance customer experience - wetlands, meadows, woods, boundaries,
Tophill Low	Habitat	Gateway	New		10		Lagoons/Marshes, Habitat development to address the current water supply and WTW process, maintain quality of reserve and bird habitat, maintain and enhance customer experience - wetlands, meadows, woods, boundaries,
Regional	Water	All	New				Site for pay and play sports. Create opps and partnerships To provide for day activities and 'bring your own' in areas of boating, windsurfing, water sports, BBQ, open water swimming, paddling
Regional	Historical	All	New				Archaeology and historical context info, protection, promotion, conservation. Interp and protect YWS historical assets. Make to most of YWS assets and promote and protect to customers - eg Scarhouse village, Dale Dike great flood, West End flooded village

Site Name/ Location	Recreation Asset Type	Recreation Strategy Site Category - post AMP 5 development	Project/ Task Type	Units- 1000m	Units - 1000m2	Unit Each	NOTES/ISSUES
Regional	Social	All	New				Conflict resolution, dogs, 4x4, sex, drugs, anti-social behaviour, swimming/public safety/asset resolving/audit/recording. Support YWS recreation and 'only available in Yorkshire campaign and protect asset investment, Possible ranger service delivery mech
Regional	Social	All	New				Support to emergency services. Sponsor police, fire services to assist increased wildlife protection and fire management
Regional	Social	All	New				Support given for green transport to sites, Support bus companies, green transport, weekend bus rides & cycle transport
Regional	Social	All	new				Development of the Public Safety Data base and checking processes.
Regional	Social	All	new				Implementation of By-laws