Vyrnwy Restoration - Outline Method Statement

Project name: Vyrnwy Restoration									
Project location: River Vyrnwy, north of Four Crosses, NGR 325806 319509									
Client: Canal & River Trust									
	Initial	Rev1	Rev2	Rev3	Rev4	Rev5	Rev6	Rev7	**Rev8**
Date	16-04-2024	27-12-2024							
By	SB	RC							
Checked	GH	SB							
Approved	**GH**	**GH**							

Summary of key works and proposed sequencing

1. Excavation of backwaters, vegetated island and point bars
2. Excavation of chutes
3. Creation of kested hedge
4. Creation of point bars
5. Creation of ditch infill

Pre-construction & construction procedure

Construction of site compounds, lay-down areas, delivery of machinery and any other initial preparatory works to be undertaken in-line with specific site work activity. All works on site will be carried out in accordance with the appropriate British Standards and industry Codes of Practice. A qualified and experienced Geomorphologist must attend the site to advise on construction procedure at certain points during the works, particularly during construction of all features and initial setting out.

Biosecurity measures outlined in the following two documents should be followed by all personnel and machinery on site:

http://www.nonnativespecies.org/checkcleandry/

Note – Stockpile excavated material temporarily outside of the floodplain. Import of material will be required to construct the point bar features but some material likely available through riddling of excavations undertaken on site. Please refer to gravel/cobble specification required. Ensure correct mix of sediment is used for creation of these features and is constructed as defined in the method statement and shown in the design drawings. Retain cohesive sediment for creation of kested hedge and ditch infill features. Any excess spoil will need to be spread elsewhere out of active flood zone areas or removed from site. When spreading material and tracking over any archaeologically sensitive areas (where applicable), this should be undertaken using Low Ground Pressure Plant.

Note – no repair or designs have been undertaken as part of this commission for any fencing and gating impacted by the design or by any access routes.

No loading assessments have been undertaken on any access bridges or culverts that may be used during the works.

No designs have been undertaken for the relocation of any footpaths.

Construction period

The construction period is expected to take ~6-8 weeks (dependent on contractor team size, seasonality of the construction works etc), ensuring cost effective delivery and minimal environmental disturbance as a result of the work on site. However, it is possible that adverse weather conditions such as periods of high rainfall (and associated river level rise), will lead to temporary cessation of some construction. Liaison should be undertaken by the client and contractor with NRW to determine an appropriate time of year for the contractor to deliver the works as some wet working may be required to construct the scheme. Contractor to consider sympathetic construction methodology.

Working in Proximity of Services

A services search has been conducted/provided for the site by the client and those supplied are shown in the design drawings against the proposed design. Best endeavours have been used to transfer the map information to the design drawings but some error in the location of these may be present as a result. Service searches could be incomplete. Dynamic Rivers accept no liability for the presence of services on site.
No utilities are likely to be directly impacted by the proposed works. However, there is an existing field drain crossing the site, this feature will be broken out/ severed as part of the proposed excavation works for the scheme. Other services may be crossed under or over during the excavation works and contractor should be aware of their presence.
A services search should be undertaken prior to works commencing on site. All services should be considered carefully by the contractor undertaking the works in terms of safe working procedures, access and crossing these utilities, with appropriate liaison with the service provider. It should be noted that standard services searches do not identify all local land drains. If encountered, these should be managed on site by the contractor and client. The contractor should review the services search drawing prior to construction and for potential access routes as some may be crossed to deliver the works. The client and/or contractor should undertake another services search prior to the works. The contractor should undertake a C.A.T4 / radio-detection scan, in liaison with the provider, and locate these services prior to excavation commencing if deemed required.
Contractors should be made aware of their location as it is possible that some may be crossed / passed under to undertake the proposed works. The contractor should set up goalposts in the vicinity of overhead lines so that machinery operators are aware of its presence and work with limiters. They should also locate any buried services before excavation begins in liaison with the service provider. Track mats may be required across buried services.
Other private services, such as land drains not already mapped, that are not picked up by utilities service searches, could be encountered during the works. This should be monitored and managed by the contractor and client on site.
Service searches do not always show manhole presence. There is a risk of water flowing across manholes and underground services more frequently, and to greater depths, as a result of floodplain reconnection works. Wetter floodplain areas also may occur around overhead services. Pylon locations are not always plotted on supplied service searches. This could mean that some pylons have been missed. This should be reviewed by the contractor on site prior to works commencing.

Public Access during the works

There is no public access to the site or public footpaths crossing the site. No public access will be granted during construction and following completion of the works.

The contractor will ensure appropriate signage and fencing off of the construction compound area and work area, and it is the responsibility of the contractor to ensure safe access for the workforce and appropriate restriction of access to the public.

Historic sites within the work zone should be fenced off to ensure no damage is caused by machinery access etc. (where relevant) and under advice of an archaeologist. When spreading material and tracking over any archaeologically sensitive areas (where applicable), this should be undertaken using Low Ground Pressure Plant.

No loading assessments have been undertaken on any access bridges or culverts that may be used during the works.

Species surveys

No ecological or protected species surveys have been undertaken as part of this commission.

Timing of vegetation clearance and temporary disturbance to river bed as part of works

Only those areas specifically identified for site clearance (to be marked out by the client and contractor prior to commencement of construction, with supervision from Dynamic Rivers) shall be cleared of existing tree and vegetation cover. Contractor to use tracking mats for river banks when entering and exiting the channels.

Work around mature trees where possible where these are encountered on site.

There are sensitive habitats and species on site. Contractor and client should consult with relevant client personnel and an ecologist before works are undertaken. Contractor to consider this through sensitive working methods.

A proportion of the works will take place in very wet floodplain areas. The principal contractor is responsible for ensuring safe working practices are followed in these areas where there is a risk of soft ground to people and machinery.

Removal, pollarding and pruning of trees and clearance of ground vegetation may be required during the bird nesting season. These works will only be undertaken immediately after the trees and vegetation have been inspected and deemed free of nesting birds and bats by an ecologist. Trees marked for felling should be retained on site and incorporated into the scheme under guidance of the geomorphologist.

Nesting bird season and other ecologically sensitive seasons are summarised below (where applicable):

- Bird nesting - March to August
- Bat roosting - April to September
- Spring salmonid run (migration) – approx. March to May (depending on local run timing)
- Salmonid spawning season – 1st October to 15th June
- Crayfish rescue should avoid late May and June when females may be carrying newly hatched young.

Note: There may be some changes to the outlined method statement as more knowledge of site conditions are gained in the pre-construction and construction phases of the project to be determined by the contractor.

Note: This outline method statement does not constitute formal construction advice, safe constructability of the proposed design is the responsibility of the contractor.

Activity: Excavation of backwaters, vegetated island and point bars	Method Statement 1

Risks: Overturning of plant machinery, crush injuries, collapse of earth banks, falling trees and branches, overhead and buried services, collision with other plant machines, pollution to watercourse, machine strike to persons, machine strike of services, insect bites and allergic reactions, snake bites, leptospirosis, manual handling, drowning, working on soft ground.

Proposed working method overview:

- Machinery to access site as agreed by the landowner and client. Track mats should be used as appropriate dependent on landowner requests and ground conditions at time of construction. Fence/gate removal and replacement may be required to facilitate / access the works areas, alongside pollarding and vegetation clearance.
- Work around mature trees where possible where these are encountered on site.
- Felled trees and stumps cleared for access purposes should be re-used on site under guidance of geomorphologist.
- Some working in close proximity to trees required. Contractor should ensure they have appropriate machinery and working procedures to ensure a safe working environment and to minimise damage to trees and vegetation.
- A services search has been conducted/provided for the site by the client and those supplied are shown in the design drawings against the proposed design. Best endeavours have been used to transfer the map information to the design drawings but some error in the location of these may be present as a result. Service searches could be incomplete.
- No utilities are likely to be directly impacted by the proposed works. However, there is an existing field drain crossing the site, this feature will be broken out/ severed as part of the proposed excavation works for the scheme. Other services may be crossed under or over during the excavation works and contractor should be aware of their presence.
- Undertake a services search and locate services on site prior to excavation commencing.
- Contractor should be aware and identify these prior to works commencing.
- There are possible services along potential access routes to site, the contractor should be aware of these and ensure suitable mitigation where necessary.
- All services should be considered carefully by the contractor undertaking the works in terms of safe working procedures, access and crossing these utilities, with appropriate liaison with the service provider.
- Temporary watercourse crossings may be required dependent on track routes and plant, this is to be agreed with the landowner, contractor and the client.
- Silt control measures to be in place downstream and across the floodplain prior to works starting, during works and inspected daily (replace / repair as necessary).
- Fish/Crayfish rescues should be undertaken through the works area prior to works starting and nets retained in the channel throughout the works under the guidance of an ecologist. Areas must be re-fished should flow overtop the nets.
- Banks to be monitored during the works. No personnel to be in the channel during works.
- Wet working approvals may be required from NRW to undertake the works – recommended that works are undertaken in the dry (contractor to overpump or bund off to create dry working areas).
- Contractor to consider access to watercourse edge and floodplain/valley side due to steep sided banks and valley side.
- Note – following feature installation there will likely be a period of time when flows should be allowed to adjust. This should be considered by the contractor. Dependent on flow volumes, topography and water levels, it could take a considerable amount of time for reconnected/excavated features and the floodplain to become wet following completion of the works. This is an unknown and the risk cannot be removed as part of the design process. Features and the floodplain could be drier than anticipated.
- The backwaters, vegetated island and point bars locations should be surveyed in on site prior to excavation commencing using coordinates that can be provided with the design drawings or feature mapping, this should also be undertaken with supervision from Dynamic Rivers.
- Excavate the backwaters, vegetated islands and point bars following levels / excavation depth and width information provided within the design drawings and under supervision of the geomorphologist (these are all connected features). The backwater bed levels are set above the main Vyrnwy channel bed level (see design drawings) and the vegetated island forms a feature between two excavated backwaters. Excavate the point bar shelves at the same time, as demonstrated in the design drawings (the proposed cobble/gravel mix will be used to infill

these areas). Leave a ~5-10m length bund at the downstream connection points to the current main channel to allow excavation to take place in the dry (this is to be removed following creation of the features). Pump any excess muddy water away from the river. Side slopes for the features can vary within a range as shown in the design drawings. Do not smooth feature surfaces or banks (leave a rough finish). Create level variability across the features to provide micro-habitat. Ensure backwater and other feature interfaces (where relevant e.g. point bars, vegetated island, chutes) are sloped and connected suitably. Ensure appropriate slopes and level connections at interfaces between these features. Excavated gravel/cobble material to be riddled and used in creation of point bars. Minimise tree disturbance wherever possible.

- Stockpile excavated material temporarily outside of the floodplain. Import of material will be required to construct the point bar features but some material likely available through riddling of excavations undertaken on site. Please refer to gravel/cobble specification required. Ensure correct mix of sediment is used for creation of these features and is constructed as defined in the method statement and shown in the design drawings. Retain cohesive sediment for creation of kested hedge and ditch infill features. Any excess spoil will need to be spread elsewhere out of active flood zone areas or removed from site. When spreading material and tracking over any archaeologically sensitive areas (where applicable), this should be undertaken using Low Ground Pressure Plant.
- Geomorphologist to review functioning and some level adjustment may be required once all features are placed/excavated, and water levels have adjusted.
- Remove any tracks into watercourse and across the working area and make good any damage. Utilise bog mats along track routes if ground becomes wet.
- Any fencing removed is to be replaced on agreement with the landowner and client.
- Seed exposed / damaged areas of floodplain, excavated areas and top of bank areas (if seeding is proposed) with suitable seed mix at 5g/m^2 spreading rate.

General Method of Work:

- Client and Principal Contractor to reconfirm area of works and mark up extent of site works.
- Check line of works for any trees to be removed, branches to be cut back, vegetation clearance etc. to ensure safe passage for machinery. Where mature trees are encountered during excavation, avoid where possible and adjust line of features if this is possible with agreement with the geomorphologist.
- Erect temporary fencing to restrict public access to the site and to fence off historic sites.
- Mark location of and install temporary protection measures to utilities, e.g. excavator mats to buried services at crossing points, goal posts for overhead cables where access routes require it.
- Install appropriate fine sediment control measures downstream of works area and across any impacted floodplain e.g. straw bales, fine sediment control mats, silt curtains. These must operate during and after in-channel features are being created, floodplain features are being excavated etc. Machinery access along the bank top or in channel must be controlled to prevent silt/fine sediment-run off from exposed banksides and from disturbed fine sediment.
- All sediment control measures are to be checked and repaired/replaced daily.
- Turbidity monitoring is to be conducted during the works. A baseline turbidity value will be determined for the River Vyrnwy through sampling prior to undertaking works on site. Agreement of threshold NTU with Natural Resources Wales should be undertaken sampling is completed. All data are to be recorded and presented to the client on a weekly basis. Visual monitoring for any silt plumes will also be undertaken during the construction phase.
- Minimise tree disturbance wherever possible.
- Contractor to consider access to watercourse edge and floodplain/valley side due to steep sided banks and valley side.

Control Measures or Modifications

- No smoking in works area.
- No works to be undertaken during the hours of darkness.
- Ensure staff are aware of risk of drowning associated with working in or near water and the health and safety requirements (as detailed in the site risk assessment by the contractor).
- If any tree felling/vegetation clearance is required, site manager to contact ordnance contractor.
- All re-fuelling will take place at least 20m away from the watercourse, next to the fuel bowser.
- Be vigilant for members of public / pets / stock / wild animals entering works area.
- Be aware of the risk of Leptospirosis in and around the watercourse.
- Ensure bucket is lowered to the ground when machine is not in use.

- When visitors are on site, stop work & lower bucket to ground if they enter the works safety area.
- If working with a Banksman ensure that they are in a position where you can see them.
- Beware of machine blind spots when slewing and turning, especially with regard to tree branches.
- Be aware of any taped off areas/sites that will be of conservation, archaeological or other special interest. Do not enter these areas with any machinery.
- As a minimum use heather bale dams / silt curtains at strategic intervals in the watercourse and across impacted floodplain areas to filter coarse sediments. Pollution booms and silt reduction measures booms to be erected at the downstream end of the works.
- All operators to be competent and certificated on the machines they operate.
- All incidents relating to safety or pollution of any kind are to be reported as soon as it is safe to do so.
- All staff and visitors to undertake induction and wear the appropriate PPE for the site conditions they encounter.
- All personnel working in the river to be confined space trained and contractor to supply appropriate PPE and evacuation procedure.

Activity: Excavation of chutes	Method Statement 2

Risks: Overturning of plant machinery, crush injuries, collapse of earth banks, falling trees and branches, overhead and buried services, collision with other plant machines, pollution to watercourse, machine strike to persons, machine strike of services, insect bites and allergic reactions, snake bites, leptospirosis, manual handling, drowning, working on soft ground.

Proposed working method overview:

- Machinery to access site as agreed by the landowner and client. Track mats should be used as appropriate dependent on landowner requests and ground conditions at time of construction. Fence/gate removal and replacement may be required to facilitate / access the works areas, alongside pollarding and vegetation clearance.
- Work around mature trees where possible where these are encountered on site.
- Felled trees and stumps cleared for access purposes should be re-used on site under guidance of geomorphologist.
- Some working in close proximity to trees required. Contractor should ensure they have appropriate machinery and working procedures to ensure a safe working environment and to minimise damage to trees and vegetation.
- A services search has been conducted/provided for the site by the client and those supplied are shown in the design drawings against the proposed design. Best endeavours have been used to transfer the map information to the design drawings but some error in the location of these may be present as a result. Service searches could be incomplete.
- No utilities are likely to be directly impacted by the proposed works. However, there is an existing field drain crossing the site, this feature will be broken out/ severed as part of the proposed excavation works for the scheme. Other services may be crossed under or over during the excavation works and contractor should be aware of their presence.
- Undertake a services search and locate services on site prior to excavation commencing.
- Contractor should be aware and identify these prior to works commencing.
- There are possible services along potential access routes to site, the contractor should be aware of these and ensure suitable mitigation where necessary.
- All services should be considered carefully by the contractor undertaking the works in terms of safe working procedures, access and crossing these utilities, with appropriate liaison with the service provider.
- Temporary watercourse crossings may be required dependent on track routes and plant, this is to be agreed with the landowner, contractor and the client.
- Silt control measures to be in place downstream and across the floodplain prior to works starting, during works and inspected daily (replace / repair as necessary).
- Fish/Crayfish rescues should be undertaken through the works area prior to works starting and nets retained in the channel throughout the works under the guidance of an ecologist. Areas must be re-fished should flow overtop the nets.
- Banks to be monitored during the works. No personnel to be in the channel during works.
- Wet working approvals may be required from NRW to undertake the works – recommended that works are undertaken in the dry (contractor to overpump or bund off to create dry working areas).
- Contractor to consider access to watercourse edge and floodplain/valley side due to steep sided banks and valley side.
- Note – following feature installation there will likely be a period of time when flows should be allowed to adjust. This should be considered by the contractor. Dependent on flow volumes, topography and water levels, it could take a considerable amount of time for reconnected/excavated features and the floodplain to become wet following completion of the works. This is an unknown and the risk cannot be removed as part of the design process. Features and the floodplain could be drier than anticipated.
- The chute locations should be surveyed in on site prior to excavation commencing using coordinates that can be provided with the design drawings or feature mapping, this should also be undertaken with supervision from Dynamic Rivers.
- Note – the chutes located in the proximity of the backwaters, vegetated island and point bars can be excavated at the same time as these features. It is advised those connected to the ditch are excavated following the other excavation works. Excavate the chutes following levels / excavation depth and width information provided within the design drawings and under supervision of the geomorphologist. The chute channel bed levels are set at a similar level to the bed level of the connecting backwater channel (where relevant) or at a similar

level to the paleo feature / level in the floodplain that it joins into (i.e. will wet at higher flows for those chute channels connected to the ditch, these are set above the ditch bed level). Leave a ~5-10m length bund at the downstream connection points to the current main channel to allow excavation to take place in the dry (this is to be removed following creation of the features). Pump any excess muddy water away from the river. Side slopes for the features can vary within a range as shown in the design drawings. Do not smooth feature surfaces or banks (leave a rough finish). Create level variability across the features to provide micro-habitat. Ensure chute channel and other feature interfaces (where relevant e.g. point bars, vegetated island, backwaters) are sloped and connected suitably. Ensure appropriate slopes and level connections at interfaces between these features. Excavated gravel/cobble material to be riddled and used in creation of point bars. Minimise tree disturbance wherever possible.

- Stockpile excavated material temporarily outside of the floodplain. Import of material will be required to construct the point bar features but some material likely available through riddling of excavations undertaken on site. Please refer to gravel/cobble specification required. Ensure correct mix of sediment is used for creation of these features and is constructed as defined in the method statement and shown in the design drawings. Retain cohesive sediment for creation of kested hedge and ditch infill features. Any excess spoil will need to be spread elsewhere out of active flood zone areas. When spreading material and tracking over any archaeologically sensitive areas (where applicable), this should be undertaken using Low Ground Pressure Plant.
- Geomorphologist to review functioning and some level adjustment may be required once all features are placed/excavated, and water levels have adjusted.
- Remove any tracks into watercourse and across the working area and make good any damage. Utilise bog mats along track routes if ground becomes wet.
- Any fencing removed is to be replaced on agreement with the landowner and client.
- Seed exposed / damaged areas of floodplain, excavated areas and top of bank areas (if seeding is proposed) with suitable seed mix at 5g/m^2 spreading rate.

General Method of Work:

- Client and Principal Contractor to reconfirm area of works and mark up extent of site works.
- Check line of works for any trees to be removed, branches to be cut back, vegetation clearance etc. to ensure safe passage for machinery. Where mature trees are encountered during excavation, avoid where possible and adjust line of features if this is possible with agreement with the geomorphologist.
- Erect temporary fencing to restrict public access to the site and to fence off historic sites.
- Mark location of and install temporary protection measures to utilities, e.g. excavator mats to buried services at crossing points, goal posts for overhead cables where access routes require it.
- Install appropriate fine sediment control measures downstream of works area and across any impacted floodplain e.g. straw bales, fine sediment control mats, silt curtains. These must operate during and after in-channel features are being created, floodplain features are being excavated etc. Machinery access along the bank top or in channel must be controlled to prevent silt/fine sediment-run off from exposed banksides and from disturbed fine sediment.
- All sediment control measures are to be checked and repaired/replaced daily.
- Turbidity monitoring is to be conducted during the works. Work must cease where levels exceed 20 NTU. Any incident exceeding 40 NTU should be considered for self-reporting to the appropriate regulatory authorities. All data are to be recorded and presented to the client on a weekly basis.
- Minimise tree disturbance wherever possible.
- Contractor to consider access to watercourse edge and floodplain/valley side due to steep sided banks and valley side.

Control Measures or Modifications

- No smoking in works area.
- No works to be undertaken during the hours of darkness.
- Ensure staff are aware of risk of drowning associated with working in or near water and the health and safety requirements (as detailed in the site risk assessment by the contractor).
- If any tree felling/vegetation clearance is required, site manager to contact ordnance contractor.
- All re-fuelling will take place at least 20m away from the watercourse, next to the fuel bowser.
- Be vigilant for members of public / pets / stock / wild animals entering works area.
- Be aware of the risk of Leptospirosis in and around the watercourse.

- Ensure bucket is lowered to the ground when machine is not in use.
- When visitors are on site, stop work & lower bucket to ground if they enter the works safety area.
- If working with a Banksman ensure that they are in a position where you can see them.
- Beware of machine blind spots when slewing and turning, especially with regard to tree branches.
- Be aware of any taped off areas/sites that will be of conservation, archaeological or other special interest. Do not enter these areas with any machinery.
- As a minimum use heather bale dams / silt curtains at strategic intervals in the watercourse and across impacted floodplain areas to filter coarse sediments. Pollution booms and silt reduction measures booms to be erected at the downstream end of the works.
- All operators to be competent and certificated on the machines they operate.
- All incidents relating to safety or pollution of any kind are to be reported as soon as it is safe to do so.
- All staff and visitors to undertake induction and wear the appropriate PPE for the site conditions they encounter.
- All personnel working in the river to be confined space trained and contractor to supply appropriate PPE and evacuation procedure.

Activity: Creation of kested hedge	Method Statement 3

Risks: Overturning of plant machinery, crush injuries, collapse of earth banks, falling trees and branches, overhead and buried services, collision with other plant machines, pollution to watercourse, machine strike to persons, machine strike of services, insect bites and allergic reactions, snake bites, leptospirosis, manual handling, drowning, working on soft ground.

Proposed working method overview:

- Machinery to access site as agreed by the landowner and client. Track mats should be used as appropriate dependent on landowner requests and ground conditions at time of construction. Fence/gate removal and replacement may be required to facilitate / access the works areas, alongside pollarding and vegetation clearance.
- Work around mature trees where possible where these are encountered on site.
- Felled trees and stumps cleared for access purposes should be re-used on site under guidance of geomorphologist.
- Some working in close proximity to trees required. Contractor should ensure they have appropriate machinery and working procedures to ensure a safe working environment and to minimise damage to trees and vegetation.
- A services search has been conducted/provided for the site by the client and those supplied are shown in the design drawings against the proposed design. Best endeavours have been used to transfer the map information to the design drawings but some error in the location of these may be present as a result. Service searches could be incomplete.
- No utilities are likely to be directly impacted by the proposed works. However, there is an existing field drain crossing the site, this feature will be broken out/ severed as part of the proposed excavation works for the scheme. Other services may be crossed under or over during the excavation works and contractor should be aware of their presence.
- Undertake a services search and locate services on site prior to excavation commencing.
- Contractor should be aware and identify these prior to works commencing.
- There are possible services along potential access routes to site, the contractor should be aware of these and ensure suitable mitigation where necessary.
- All services should be considered carefully by the contractor undertaking the works in terms of safe working procedures, access and crossing these utilities, with appropriate liaison with the service provider.
- Temporary watercourse crossings may be required dependent on track routes and plant, this is to be agreed with the landowner, contractor and the client.
- Silt control measures to be in place downstream and across the floodplain prior to works starting, during works and inspected daily (replace / repair as necessary).
- Fish/Crayfish rescues should be undertaken through the works area prior to works starting and nets retained in the channel throughout the works under the guidance of an ecologist. Areas must be re-fished should flow overtop the nets.
- Banks to be monitored during the works. No personnel to be in the channel during works.
- Wet working approvals may be required from NRW to undertake the works – recommended that works are undertaken in the dry (contractor to overpump or bund off to create dry working areas).
- Contractor to consider access to watercourse edge and floodplain/valley side due to steep sided banks and valley side.
- Note – following feature installation there will likely be a period of time when flows should be allowed to adjust. This should be considered by the contractor. Dependent on flow volumes, topography and water levels, it could take a considerable amount of time for reconnected/excavated features and the floodplain to become wet following completion of the works. This is an unknown and the risk cannot be removed as part of the design process. Features and the floodplain could be drier than anticipated.
- The kested hedge location should be surveyed on site prior to excavation commencing using coordinates that can be provided with the design drawings or feature mapping, this should also be undertaken with supervision from Dynamic Rivers.
- Using cohesive excavated material from other works locally, form the kest to the heights and widths shown on the design drawings. Construct in 300 mm layers and roll or tamp. Side slopes should be no steeper than 20-30deg. Ensure ends of the kest tie into areas as shown on the design drawings and ties in suitably with backwater slopes. Plant with proposed hedgerow mix as required.

- Geomorphologist to review functioning and some level adjustment may be required once all features are placed/excavated, and water levels have adjusted.
- Remove any tracks into watercourse and across the working area and make good any damage. Utilise bog mats along track routes if ground becomes wet.
- Any fencing removed is to be replaced on agreement with the landowner and client.
- Seed exposed / damaged areas of floodplain, excavated areas and top of bank areas (if seeding is proposed) with suitable seed mix at 5g/m^2 spreading rate.

General Method of Work:

- Client and Principal Contractor to reconfirm area of works and mark up extent of site works.
- Check line of works for any trees to be removed, branches to be cut back, vegetation clearance etc. to ensure safe passage for machinery. Where mature trees are encountered during excavation, avoid where possible and adjust line of features if this is possible with agreement with the geomorphologist.
- Erect temporary fencing to restrict public access to the site and to fence off historic sites.
- Mark location of and install temporary protection measures to utilities, e.g. excavator mats to buried services at crossing points, goal posts for overhead cables where access routes require it.
- Install appropriate fine sediment control measures downstream of works area and across any impacted floodplain e.g. straw bales, fine sediment control mats, silt curtains. These must operate during and after in-channel features are being created, floodplain features are being excavated etc. Machinery access along the bank top or in channel must be controlled to prevent silt/fine sediment-run off from exposed banksides and from disturbed fine sediment.
- All sediment control measures are to be checked and repaired/replaced daily.
- Turbidity monitoring is to be conducted during the works. Work must cease where levels exceed 20 NTU. Any incident exceeding 40 NTU should be considered for self-reporting to the appropriate regulatory authorities. All data are to be recorded and presented to the client on a weekly basis.
- Minimise tree disturbance wherever possible.
- Contractor to consider access to watercourse edge and floodplain/valley side due to steep sided banks and valley side.

Control Measures or Modifications

- No smoking in works area.
- No works to be undertaken during the hours of darkness.
- Ensure staff are aware of risk of drowning associated with working in or near water and the health and safety requirements (as detailed in the site risk assessment by the contractor).
- If any tree felling/vegetation clearance is required, site manager to contact ordnance contractor.
- All re-fuelling will take place at least 20m away from the watercourse, next to the fuel bowser.
- Be vigilant for members of public / pets / stock / wild animals entering works area.
- Be aware of the risk of Leptospirosis in and around the watercourse.
- Ensure bucket is lowered to the ground when machine is not in use.
- When visitors are on site, stop work & lower bucket to ground if they enter the works safety area.
- If working with a Banksman ensure that they are in a position where you can see them.
- Beware of machine blind spots when slewing and turning, especially with regard to tree branches.
- Be aware of any taped off areas/sites that will be of conservation, archaeological or other special interest. Do not enter these areas with any machinery.
- As a minimum use heather bale dams / silt curtains at strategic intervals in the watercourse and across impacted floodplain areas to filter coarse sediments. Pollution booms and silt reduction measures booms to be erected at the downstream end of the works.
- All operators to be competent and certificated on the machines they operate.
- All incidents relating to safety or pollution of any kind are to be reported as soon as it is safe to do so.
- All staff and visitors to undertake induction and wear the appropriate PPE for the site conditions they encounter.
- All personnel working in the river to be confined space trained and contractor to supply appropriate PPE and evacuation procedure.

Activity: Creation of point bars	Method Statement 4

Risks: Overturning of plant machinery, crush injuries, collapse of earth banks, falling trees and branches, overhead and buried services, collision with other plant machines, pollution to watercourse, machine strike to persons, machine strike of services, insect bites and allergic reactions, snake bites, leptospirosis, manual handling, drowning, working on soft ground.

Proposed working method overview:

- Machinery to access site as agreed by the landowner and client. Track mats should be used as appropriate dependent on landowner requests and ground conditions at time of construction. Fence/gate removal and replacement may be required to facilitate / access the works areas, alongside pollarding and vegetation clearance.
- Work around mature trees where possible where these are encountered on site.
- Felled trees and stumps cleared for access purposes should be re-used on site under guidance of geomorphologist.
- Some working in close proximity to trees required. Contractor should ensure they have appropriate machinery and working procedures to ensure a safe working environment and to minimise damage to trees and vegetation.
- A services search has been conducted/provided for the site by the client and those supplied are shown in the design drawings against the proposed design. Best endeavours have been used to transfer the map information to the design drawings but some error in the location of these may be present as a result. Service searches could be incomplete.
- No utilities are likely to be directly impacted by the proposed works. However, there is an existing field drain crossing the site, this feature will be broken out/ severed as part of the proposed excavation works for the scheme. Other services may be crossed under or over during the excavation works and contractor should be aware of their presence.
- Undertake a services search and locate services on site prior to excavation commencing.
- Contractor should be aware and identify these prior to works commencing.
- There are possible services along potential access routes to site, the contractor should be aware of these and ensure suitable mitigation where necessary.
- All services should be considered carefully by the contractor undertaking the works in terms of safe working procedures, access and crossing these utilities, with appropriate liaison with the service provider.
- Temporary watercourse crossings may be required dependent on track routes and plant, this is to be agreed with the landowner, contractor and the client.
- Silt control measures to be in place downstream and across the floodplain prior to works starting, during works and inspected daily (replace / repair as necessary).
- Fish/Crayfish rescues should be undertaken through the works area prior to works starting and nets retained in the channel throughout the works under the guidance of an ecologist. Areas must be re-fished should flow overtop the nets.
- Banks to be monitored during the works. No personnel to be in the channel during works.
- Wet working approvals may be required from NRW to undertake the works – recommended that works are undertaken in the dry (contractor to overpump or bund off to create dry working areas).
- Contractor to consider access to watercourse edge and floodplain/valley side due to steep sided banks and valley side.
- Note – following feature installation there will likely be a period of time when flows should be allowed to adjust. This should be considered by the contractor. Dependent on flow volumes, topography and water levels, it could take a considerable amount of time for reconnected/excavated features and the floodplain to become wet following completion of the works. This is an unknown and the risk cannot be removed as part of the design process. Features and the floodplain could be drier than anticipated.
- The point bar locations should be surveyed in on site prior to them being created using coordinates that can be provided with the design drawings or feature mapping, this should also be undertaken with supervision from Dynamic Rivers.
- Ensure the point bar material is well mixed prior to placement (utilise any retained riddled material if appropriate for use – rest of material mix will need importing) and the material is well compacted when placed using the back of the digger bucket. Create level variability across the feature surfaces. Slopes can vary on the upstream, downstream and side slopes as demonstrated in the design drawings, and should be graded into the bank or feature edge/top (e.g. vegetated islands, backwaters, chute channels etc). This should be undertaken

under the supervision of the onsite geomorphologist/client. Adjustment of levels may be required once all features are placed, and water levels have adjusted.
- Monitor upstream water level impact as required.
- Geomorphologist to review functioning and some level adjustment may be required once all features are placed, and water levels have adjusted.
- Re-use any suitable riddled excavated material from other works where possible.
- Remove any tracks into watercourse and across the working area and make good any damage. Utilise bog mats along track routes if ground becomes wet.
- Any fencing removed is to be replaced on agreement with the landowner and client.
- Seed exposed / damaged areas of floodplain, excavated areas and top of bank areas (if seeding is proposed) with suitable seed mix at 5g/m^2 spreading rate.

General Method of Work:
- Client and Principal Contractor to reconfirm area of works and mark up extent of site works.
- Check line of works for any trees to be removed, branches to be cut back, vegetation clearance etc. to ensure safe passage for machinery. Where mature trees are encountered during excavation, avoid where possible and adjust line of features if this is possible with agreement with the geomorphologist.
- Erect temporary fencing to restrict public access to the site and to fence off historic sites.
- Mark location of and install temporary protection measures to utilities, e.g. excavator mats to buried services at crossing points, goal posts for overhead cables where access routes require it.
- Install appropriate fine sediment control measures downstream of works area and across any impacted floodplain e.g. straw bales, fine sediment control mats, silt curtains. These must operate during and after in-channel features are being created, floodplain features are being excavated etc. Machinery access along the bank top or in channel must be controlled to prevent silt/fine sediment-run off from exposed banksides and from disturbed fine sediment.
- All sediment control measures are to be checked and repaired/replaced daily.
- Turbidity monitoring is to be conducted during the works. Work must cease where levels exceed 20 NTU. Any incident exceeding 40 NTU should be considered for self-reporting to the appropriate regulatory authorities. All data are to be recorded and presented to the client on a weekly basis.
- Minimise tree disturbance wherever possible.
- Contractor to consider access to watercourse edge and floodplain/valley side due to steep sided banks and valley side.

Control Measures or Modifications
- No smoking in works area.
- No works to be undertaken during the hours of darkness.
- Ensure staff are aware of risk of drowning associated with working in or near water and the health and safety requirements (as detailed in the site risk assessment by the contractor).
- If any tree felling/vegetation clearance is required, site manager to contact ordnance contractor.
- All re-fuelling will take place at least 20m away from the watercourse, next to the fuel bowser.
- Be vigilant for members of public / pets / stock / wild animals entering works area.
- Be aware of the risk of Leptospirosis in and around the watercourse.
- Ensure bucket is lowered to the ground when machine is not in use.
- When visitors are on site, stop work & lower bucket to ground if they enter the works safety area.
- If working with a Banksman ensure that they are in a position where you can see them.
- Beware of machine blind spots when slewing and turning, especially with regard to tree branches.
- Be aware of any taped off areas/sites that will be of conservation, archaeological or other special interest. Do not enter these areas with any machinery.
- As a minimum use heather bale dams / silt curtains at strategic intervals in the watercourse and across impacted floodplain areas to filter coarse sediments. Pollution booms and silt reduction measures booms to be erected at the downstream end of the works.
- All operators to be competent and certificated on the machines they operate.
- All incidents relating to safety or pollution of any kind are to be reported as soon as it is safe to do so.
- All staff and visitors to undertake induction and wear the appropriate PPE for the site conditions they encounter.

- All personnel working in the river to be confined space trained and contractor to supply appropriate PPE and evacuation procedure.

Activity: Creation of ditch infill	Method Statement 5

Risks: Overturning of plant machinery, crush injuries, collapse of earth banks, falling trees and branches, overhead and buried services, collision with other plant machines, pollution to watercourse, machine strike to persons, machine strike of services, insect bites and allergic reactions, snake bites, leptospirosis, manual handling, drowning, working on soft ground.

Proposed working method overview:

- Machinery to access site as agreed by the landowner and client. Track mats should be used as appropriate dependent on landowner requests and ground conditions at time of construction. Fence/gate removal and replacement may be required to facilitate / access the works areas, alongside pollarding and vegetation clearance.
- Work around mature trees where possible where these are encountered on site.
- Felled trees and stumps cleared for access purposes should be re-used on site under guidance of geomorphologist.
- Some working in close proximity to trees required. Contractor should ensure they have appropriate machinery and working procedures to ensure a safe working environment and to minimise damage to trees and vegetation.
- A services search has been conducted/provided for the site by the client and those supplied are shown in the design drawings against the proposed design. Best endeavours have been used to transfer the map information to the design drawings but some error in the location of these may be present as a result. Service searches could be incomplete.
- No utilities are likely to be directly impacted by the proposed works. However, there is an existing field drain crossing the site, this feature will be broken out/ severed as part of the proposed excavation works for the scheme. Other services may be crossed under or over during the excavation works and contractor should be aware of their presence.
- Undertake a services search and locate services on site prior to excavation commencing.
- Contractor should be aware and identify these prior to works commencing.
- There are possible services along potential access routes to site, the contractor should be aware of these and ensure suitable mitigation where necessary.
- All services should be considered carefully by the contractor undertaking the works in terms of safe working procedures, access and crossing these utilities, with appropriate liaison with the service provider.
- Temporary watercourse crossings may be required dependent on track routes and plant, this is to be agreed with the landowner, contractor and the client.
- Silt control measures to be in place downstream and across the floodplain prior to works starting, during works and inspected daily (replace / repair as necessary).
- Fish/Crayfish rescues should be undertaken through the works area prior to works starting and nets retained in the channel throughout the works under the guidance of an ecologist. Areas must be re-fished should flow overtop the nets.
- Banks to be monitored during the works. No personnel to be in the channel during works.
- Wet working approvals may be required from NRW to undertake the works – recommended that works are undertaken in the dry (contractor to overpump or bund off to create dry working areas).
- Contractor to consider access to watercourse edge and floodplain/valley side due to steep sided banks and valley side.
- Note – following feature installation there will likely be a period of time when flows should be allowed to adjust. This should be considered by the contractor. Dependent on flow volumes, topography and water levels, it could take a considerable amount of time for reconnected/excavated features and the floodplain to become wet following completion of the works. This is an unknown and the risk cannot be removed as part of the design process. Features and the floodplain could be drier than anticipated.
- Note - ditch infill designed to push flow easterly, levels on site to be checked to ensure preferential flow path is east onto site rather than west onto third party land, minor level adjustment may be required to the ditch infill on-site ensure this is achieved.
- The proposed ditch infill locations should be surveyed in on site prior to creation commencing using coordinates that can be provided with the design drawings or feature mapping, this should also be undertaken with supervision from Dynamic Rivers.
- Following completion of all other excavation and feature placement, using cohesive excavated material from other works locally, form the ditch infill features to the heights and widths shown on the design drawings (to ~200mm above local bank/floodplain level).

Construct in 300 mm layers and roll or tamp with bucket. Create using heights, widths and slopes provided in the design drawings.

- Geomorphologist to review functioning and some level adjustment may be required once all features are placed, and water levels have adjusted.
- Remove any tracks into watercourse and across the working area and make good any damage. Utilise bog mats along track routes if ground becomes wet.
- Any fencing removed is to be replaced on agreement with the landowner and client.
- Seed exposed / damaged areas of floodplain, excavated areas and top of bank areas (if seeding is proposed) with suitable seed mix at 5g/m^2 spreading rate.

General Method of Work:

- Client and Principal Contractor to reconfirm area of works and mark up extent of site works.
- Check line of works for any trees to be removed, branches to be cut back, vegetation clearance etc. to ensure safe passage for machinery. Where mature trees are encountered during excavation, avoid where possible and adjust line of features if this is possible with agreement with the geomorphologist.
- Erect temporary fencing to restrict public access to the site and to fence off historic sites.
- Mark location of and install temporary protection measures to utilities, e.g. excavator mats to buried services at crossing points, goal posts for overhead cables where access routes require it.
- Install appropriate fine sediment control measures downstream of works area and across any impacted floodplain e.g. straw bales, fine sediment control mats, silt curtains. These must operate during and after in-channel features are being created, floodplain features are being excavated etc. Machinery access along the bank top or in channel must be controlled to prevent silt/fine sediment-run off from exposed banksides and from disturbed fine sediment.
- All sediment control measures are to be checked and repaired/replaced daily.
- Turbidity monitoring is to be conducted during the works. Work must cease where levels exceed 20 NTU. Any incident exceeding 40 NTU should be considered for self-reporting to the appropriate regulatory authorities. All data are to be recorded and presented to the client on a weekly basis.
- Minimise tree disturbance wherever possible.
- Contractor to consider access to watercourse edge and floodplain/valley side due to steep sided banks and valley side.

Control Measures or Modifications

- No smoking in works area.
- No works to be undertaken during the hours of darkness.
- Ensure staff are aware of risk of drowning associated with working in or near water and the health and safety requirements (as detailed in the site risk assessment by the contractor).
- If any tree felling/vegetation clearance is required, site manager to contact ordnance contractor.
- All re-fuelling will take place at least 20m away from the watercourse, next to the fuel bowser.
- Be vigilant for members of public / pets / stock / wild animals entering works area.
- Be aware of the risk of Leptospirosis in and around the watercourse.
- Ensure bucket is lowered to the ground when machine is not in use.
- When visitors are on site, stop work & lower bucket to ground if they enter the works safety area.
- If working with a Banksman ensure that they are in a position where you can see them.
- Beware of machine blind spots when slewing and turning, especially with regard to tree branches.
- Be aware of any taped off areas/sites that will be of conservation, archaeological or other special interest. Do not enter these areas with any machinery.
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- All operators to be competent and certificated on the machines they operate.
- All incidents relating to safety or pollution of any kind are to be reported as soon as it is safe to do so.
- All staff and visitors to undertake induction and wear the appropriate PPE for the site conditions they encounter.
- All personnel working in the river to be confined space trained and contractor to supply appropriate PPE and evacuation procedure.

General mitigation of construction impacts on habitats / species

A site Operational Management plan shall be developed by the contractor with reference to the following elements:

Element	Suggested action	Required
Water quality	Control of silt run-off and potential for machinery pollution source	YES
River crossing	Control of disturbance, contamination, silt release, noise, vibration, debris, flooding	YES
Site waste recycling plan	Re-use on site where possible	YES
Noise and dust	Timing of works; selection of plant	YES
Protected species Protection Plans	Follow species protection plans if applicable.	TBD
Invasive plant species, pests & diseases	Fence giant hogweed, remove other invasives during site preparation where present/necessary Himalayan Balsam present on site, contractor to specify mitigation measures.	TBD