Surface Water Drainage and Flood Risk Management

A presentation to: Chichester Climate Change Group

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Coastal Partners

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Introduction to Coastal Partners

Coastal Partners

Local Authority Collective founded in 2012.

Havant, Portsmouth, Fareham, Gosport and Chichester.

Pooled Resources to lead on Coastal Matters.

Aim: Protect Homes, Businesses, Wildlife and Infrastructure.

Flooding and Coastal Erosion Risk Management.

Planning/Designing/Delivering Coastal Defence Schemes.

Maintaining Existing Assets.

Working towards a resilient future.

Specialists in: Habitats, Environmental Matters, Geomatics (collection, analysis and presentation of geographic data), Funding and Research.

It is our vision to, **manage coastlines, improve community resilience and enhance the natural environment.**

Introduction to Duncan Keir

- **Environmental Health/Food Science background**
- **2008: C.D.C. Environmental Health Technician**
- **2016: Engineering Team (Coastal and Land Drainage)**
- **2022: Seconded to Coastal Partners**
- **2023: Transferred to Coastal Partners**
- **1st Class BEng (Hons) Civil Engineering Degree**

Bio

Duncan started working for Coastal Partners in July 2022, when Chichester District Council joined the partnership. Prior to that, Duncan had worked at Chichester DC for 15 years; with the first 9 years working as an Environmental Protection Technical Officer specialising in water related aspects of public health. After this he moved on to spend the following 6 years as a Coastal and Water Management Engineer in Chichester' DC's Engineering Team.

Duncan initially graduated from Reading University in 2000 with a BSc (Hons) in Food Science, but later went back to university and obtained a First Class BEng (Hons) Degree in Civil Engineering from Portsmouth University to help further his career in Coastal Engineering.

Duncan Keir
Coastal Engineer

Climate Change and Drainage (Why am I here today?)

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- **Warmer Air = Greater Capacity to Hold Water Vapour = More Intensive Storms**
- **Flooding incidents**
  - **More frequent**
  - **More severe**
- **Flooding Types**
  - **Fluvial: River/Watercourse**
    - Excess water overwhelming watercourses.
    - It does not need to be raining at location of the flooding
  - **Pluvial: Surface Water Flooding/Flash Flooding Due to Rainfall**
  - **Groundwater**
  - **Tidal**

The affect of Flooding

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Flooding Results in:

- Death and Disease
- Traumatic Experience
  - Stress
  - Mental Heath
- Economic Harm
- Ecological Harm

What can I/we do to reduce the likelihood of Flooding?

- **Sustainable Development**
  - Making Space for Water
- **Watercourse Maintenance**

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Sustainable Development

The Role of the Local Planning Authority

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New Development should not increase flood risk on or off site.

- Statutory Technical Consultees
  - Major = WSCC as the Lead Local Flood Aothority
  - Minor = Me! (Coastal Partners on behalf of Chichester D.C.)
    - My role = Advise planning officer on “Flood Risk” and “Surface Water Drainage” (SuDS).
    - Direct Development away from the areas at highest risk.
      - Flood Risk Maps

Developers are not required to solve existing flooding problems, but they must not exacerbate them!

SuDS Principles and The Drainage Hierarchy

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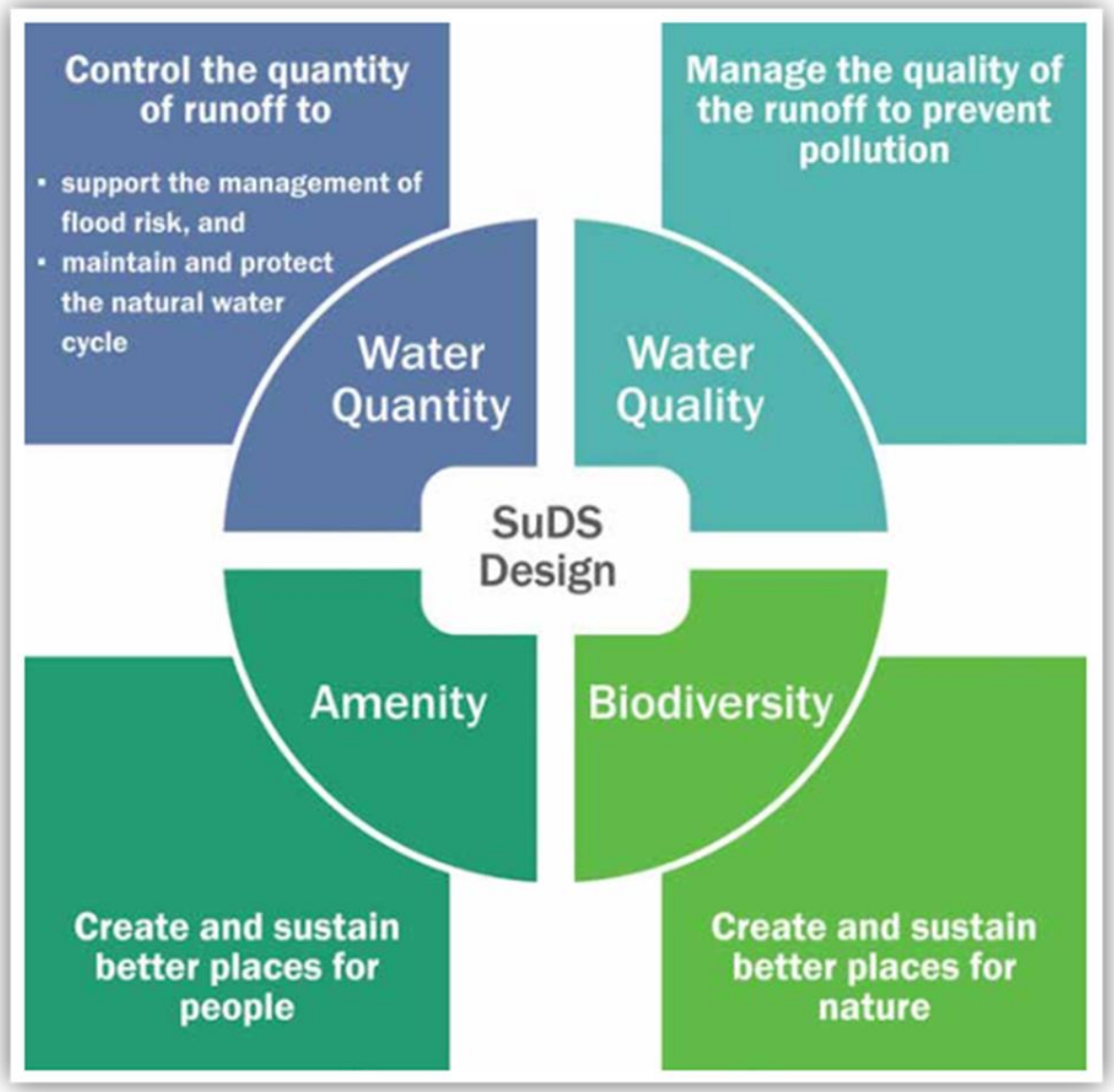

Appraisal/Acceptance of Developer's Proposals

I advise the planning officer with regards to:

- Pre-existing flood risk
- Effect of development on flood risk
- Drainage Hierarchy
- Ground Investigations (Groundwater/Percolation)
- Policy Compliance.
- Ease of Maintenance.

Drainage Hierarchy

1. On-site Infiltration (at source).
2. Attenuation/Restricted discharge to watercourse.
3. Attenuation/Restricted discharge to surface water sewer.
4. Attenuation/Restricted discharge to the foul sewer.

SuDS Features

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- Infiltration systems, such as soak-away structures.
- Rainwater Harvesting.
- Green roofs, to attenuate water and promote transpiration.
- Permeable surfaces.
- Bio-retention systems (rain gardens etc.).
- Swales, detention basins, ponds and wetlands (mimicking natural morphology).
- Flow control devices.

- Mitigate development by managing water near to where it falls.
- Prevent run-off leaving site.
- Reduce run-off rates and volumes.
- Improve water quality (‘SuDS treatment train’).
- Increase amenity.
- Habitat conservation/creation.
- SuDS are designed to meet the challenge of future climate change.

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Watercourse Maintenance

Common Law Right to Natural Drainage

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Natural Flow from High Ground to Lower Ground is "legal" including over ownership boundaries.

Exceptions:

- Where alterations or development of higher land has rendered the run-off "unnatural" in character.
    - Surfacing altered, structure built, works undertaken to channel diffuse flow.
- Un-natural run-off, must be appropriately controlled.

Lower landowners have a right to object to, and reject, uncontrolled unnatural run-off from higher land.

Lower landowners:

- Must accept **natural run-off**.
- Should not take any action to prevent natural flows entering their land.

Exception:

- All landowners have the right to take reasonable action to prevent their land being flooded.

Caveats to the Exception!!!

- Preventative measures/works must not create a similar problem for a different landowner.
- Flow must not be directed/discharged onto the public highway.
- All applicable permissions and consents must be obtained (with the possible exception of emergency situations/measures).

If run-off from higher ground is causing problems on your land:

- Attempt to resolve the issue informally.
    - If the run-off in question is 'natural', the owner of the higher ground may be under no obligation to alter the situation.
    - If the run-off cannot be considered 'natural':
        - Civil Action may be possible.
        - The local council may be able to intervene, **but this is only likely to be the case where the problematic run-off is a direct result of a contravention of planning law, or a breach of the Land Drainage Act**.

Watercourse Classifications and Definitions

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- Designated Main Rivers
- Ordinary Watercourses
- Highway Drainage
- Public Surface Water Sewers
- Public Combined Sewers
- Private Drainage

Flood Risk Management Organisations (RMA's)

Ordinary Watercourses

Chichester District Council (Coastal Partners)

- Permissive Powers

West Sussex County Council (Lead Local Flood Authority)

- Enforcement Powers (Land Drainage Act 1991)

Designated Main Rivers

Environment Agency

- Permissive Powers and Enforcement Powers

Riparian Landownership (Land Drainage Act 1991)

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- **What is a Riparian?**
  - A landowner with a watercourse (open/piped) running through, or adjacent to the boundary of, their land.

- **Riparian Rights**
  - You have the right to protect your property against flooding from the watercourse.
  - You have the right prevent erosion of the watercourse banks.

- **Riparian Responsibilities** (requirements of the Land Drainage Act)
  - Maintain watercourses under your control in a clear and free flowing condition
  - Accept and Pass on flow received from upstream
  - Seek and obtain consent prior to alterations

Riparian Landownership (Land Drainage Act 1991)

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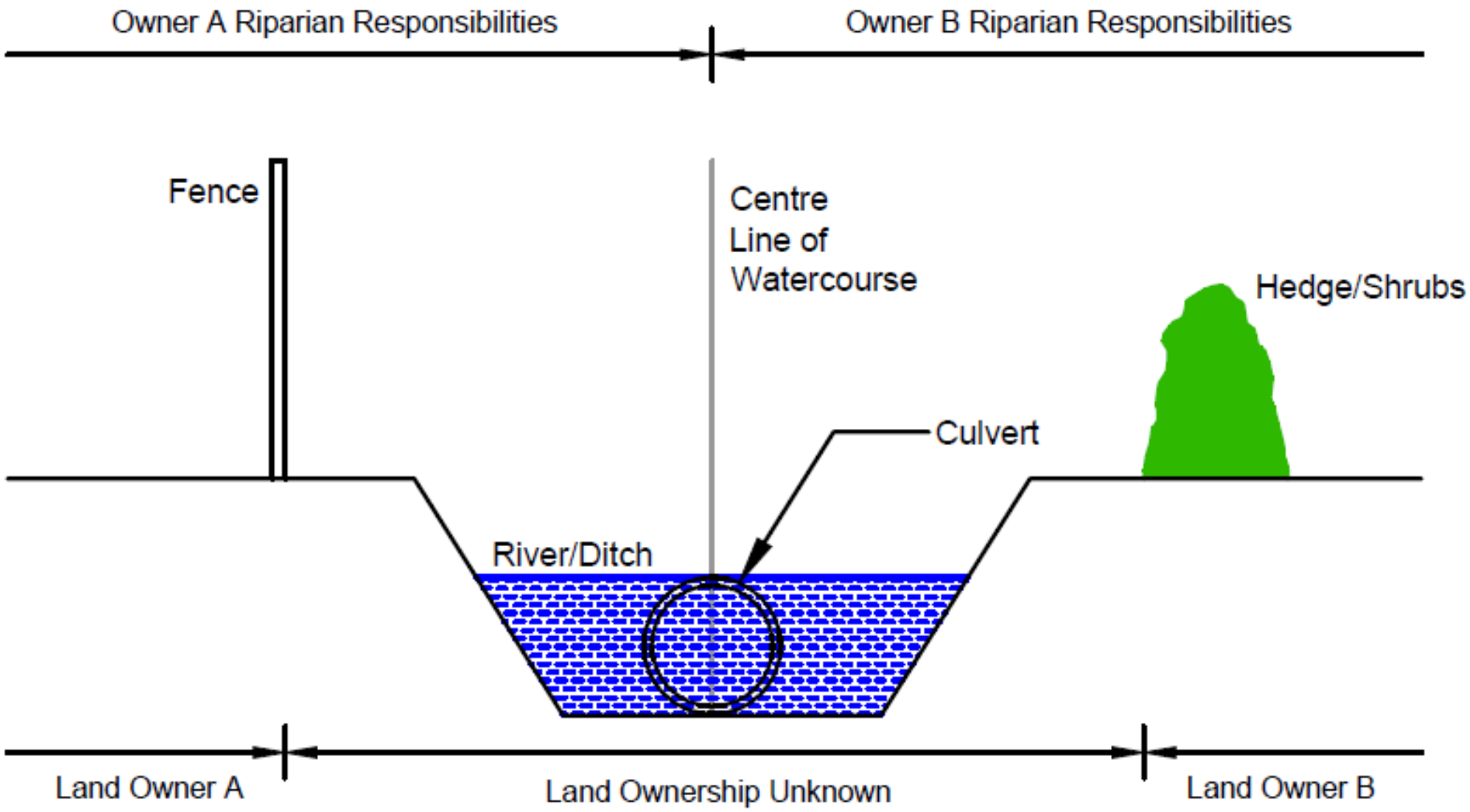

Riparian Landownership (Land Drainage Act 1991)

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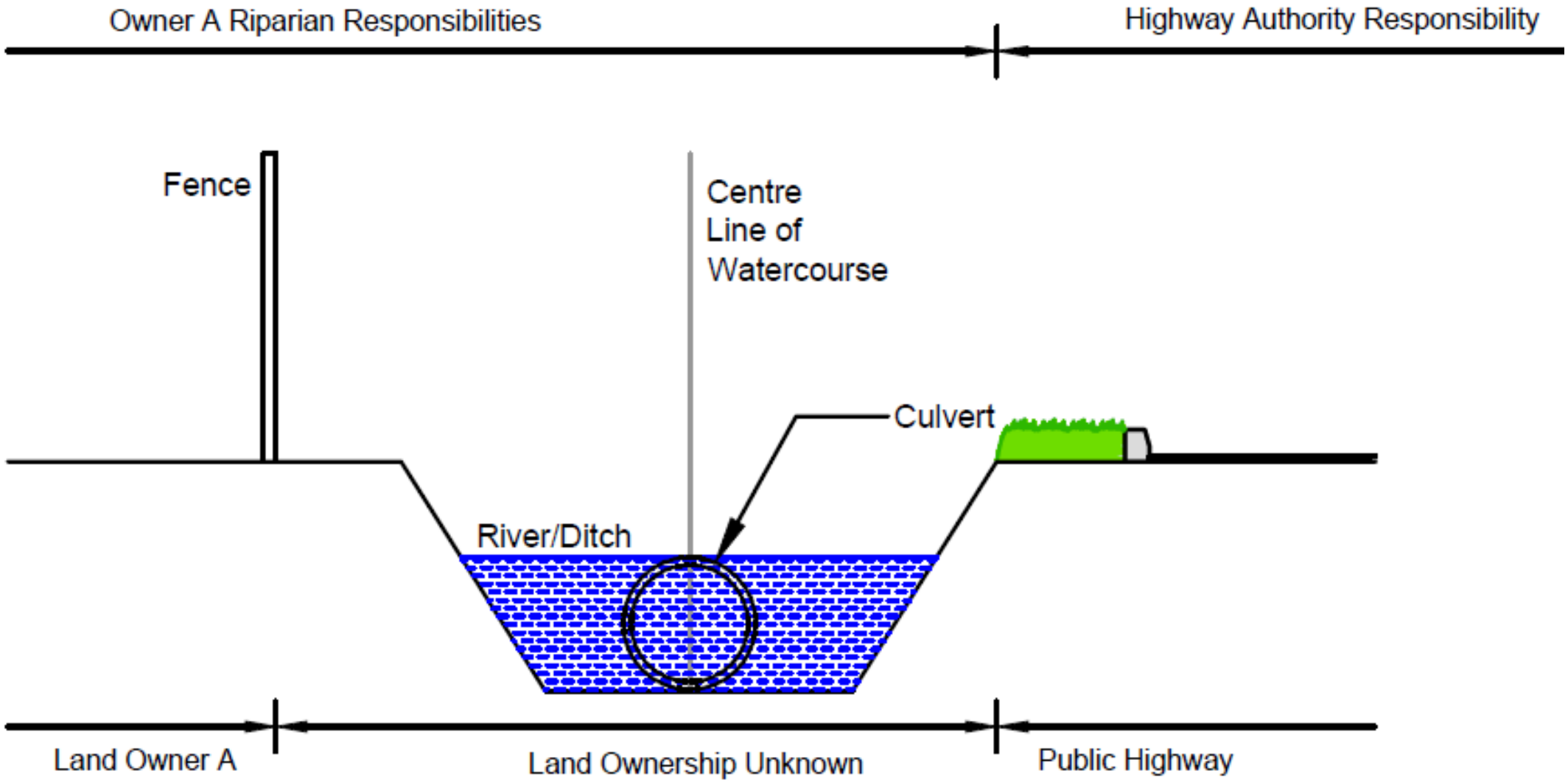

Ordinary Watercourse Consent (LDA 1991)

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Consenting (any alteration that affects the flow)

- Making sure people don't do stupid things!!!

WSCC Culvert Policy

I hate culverts!

Reasons for general opposition to culverting:

- Capacity
- Ability for water to enter watercourse
- Ecologically sterile
- Construction over top (finite service life)
- Misconnections (foul)
- Difficult to maintain
- Difficult to spot/resolve problems

Investigation and Enforcement Work

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- Complaint Received
- Initial investigations
- Informal requests for action
- Referral to LLFA's Legal Team
- Letter from LLFA lawyers
- Formal notice
- Works in default
- Charge against property

Routine Watercourse Maintenance

Siltation: Obstructs Flow, Reduces Capacity. **Excess vegetation**: Obstructs flow.

- Ensure ditch capacity and ability to flow is maintained.
- Undertake works in autumn, prior to wet winter months.
  - Not too early otherwise vegetation grows back.
- Keep silt on site
- Slowing the flow/making space for water is great in right places but not where there are sensitive receptors upstream.
- Removal of Excess vegetation **from the channel of the watercourse.**
  - The cutting down of vegetation on one side of the ditch annually will keep the ditch clear, leave stabilised banks, look attractive and encourage wildlife.
  - Alternating this cut from one bank to another each year will encourage biodiversity especially if some sections are left untouched.

Culverts

- Prevent standing water in culverts: Ditch beds slightly lower than culverts
  - Suspended matter falls out of suspension when water slows.

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Questions?

1. What are the challenges we are facing, that keep you awake in the wee small hours of the morning?