VUDM
Victorian Urban Drainage Manual

PROGRESS UPDATE | SV CONFERENCE 2026

Victorian Urban Drainage Manual

A statewide strategy for drainage design

Alice Lisitsa
President, Stormwater Victoria
On behalf of the VUDM Working Group

www.vudm.com.au

TODAY

Session outline

01

Why VUDM

The drainage challenge in Victoria and the gap a statewide manual fills.

02

What it is

Document scope, structure, intent and the working group behind it.

03

Progress since 2025

Funding, governance, Chapter 4 and 5 drafts, engagement.

04

Tools & launches

SWMP workflow and tool, website launch.

05

What's next

Roadmap, governance, and how to get involved.

What VUDM is

01

Prescriptive & specific

Not a high-level guideline - a practical 'how-to' for designers and approvers, with worked examples and guided solutions.

02

Statewide

One framework that works across all Victorian jurisdictions while aligning with national references (ARR) and authority guidance (MW).

03

A living document

Online, versioned, and updated as practice evolves - not a static PDF that goes stale on a shelf.

Available online by subscription, with training pathways to support adoption.

Why a Victorian Urban Drainage Manual?

Drainage design is everywhere.

Every development - subdivisions, urban infill, PSPs and major infrastructure - depends on effective stormwater systems to manage flows, protect waterways and minimise flood risk.

Yet there is no consolidated statewide manual.

Designers and authorities navigate fragmented standards on every project.

8+
Overlapping design references in common use

79
Victorian councils, each with local requirements

1
Statewide manual we still don't have

FRAGMENTED

The current Victorian model

Drainage design across Victoria is informed by a wide range of standards, applied differently between authorities, councils and jurisdictions.

ARR

Australian Rainfall and Runoff

National baseline

IDM

Local Government Infrastructure Design Manual

Council-led

EDCM

VPA Engineering Design and Construction Manual

PSPs / greenfield

MW

Melbourne Water suite of guidelines

Designated waterways

LCS

Local Council Standards

79 councils

AUS

Austroads guidance

Road-related drainage

Individually valuable. Collectively inconsistent.

INDUSTRY PAIN

The gaps we keep tripping over

? Inconsistent losses & coefficients

Different defaults across IDM/EDCM/MW - same site, different answers.

? Software ambiguity

No clear guidance on which models suit which catchments or which method.

? OSD methods proliferation

Multiple sizing methods in circulation; little consensus on applicability.

? Small-catchment hydrology

ARR is silent on very small catchments; designers fall back on local rules.

? Worked examples missing

Practitioners need step-by-step guidance, not just principles.

? No single source of truth

Designers and approvers spend disproportionate effort reconciling references.

SEVEN CHAPTERS

Manual structure

1	Introduction	
2	IWM approach	
3	Planning & legal framework (Vic)	
4	Stormwater management planning & investigations	IN DRAFT
5	Stormwater design - concept / functional / detailed	IN DRAFT
6	Construction issues	
7	Operation & maintenance	

Phase 1 focus: Chapters 4 & 5 - the technical core of stormwater planning and design.

Chapter 4 — proposed table of contents

Stormwater Management Planning and Investigations — the technical core of how we frame a site, set objectives, and investigate before we design.

4a. Stormwater Management Plan

- WSUD objectives (span across everything)
- Flow management
- Water quality management
- Waterway management
- Amenity
- Worked examples

4b. Investigations

- Catchment hydrology
- Hydraulic behaviour
- WQ and flow regime baseline
- Modelling options and recommended uses
- Waterway, ecology and cultural considerations
- Worked examples

Source: VUDM Framework Development • Water Technology & E2Design Lab (2023).

Chapter 5 — proposed table of contents

Stormwater Design — concept, functional and detailed design across flow, volume, water quality, waterway and safety.

5a. Flow management

Minor system (pipe design)
- ARR general concepts
- Mannings, HGL
- Friction, pit & other losses

Major system (overland flow)
- Retarding basins (dry/wet)
- On-site detention
- Waterway capacity, crossings, outfalls
- Flood risk & impact (>1%, CC)
- Surface flow modelling (1D/2D)

Worked examples

5b. Volume

- Volume management targets
- Harvesting & reuse
- Long-term simulation / modelling
- Annual & seasonal flow variations
- Downstream impacts (peak + volume)
- Surface-groundwater interactions
- Worked examples

5c. Water quality

End-of-line systems
- Wetlands
- Bioretention

Distributed systems
- Tanks, tree pits, swales

Other systems

Worked examples

5d. Waterway + 5e. Safety

5d. Waterway design
- Refer existing guidelines
- Worked examples

5e. Safety in design
- Whole sub-chapter

Source: VUDM Framework Development • Water Technology & E2Design Lab (2023).

Our working group

Authors and reviewers driving chapter development.

Alice Lisitsa

President, Stormwater Victoria

BG&E

Jamie Tainton

Vice President, SV • ALDE

Director, Water Studio

Jon Griffin

President, LGIDA

Greater Shepparton CC

Chris Beardshaw

Principal

Afflux

Karl Velasco

Working Group

SMEC

David Moret

Working Group

DPM Consulting Group

Cross-industry: councils, consultants, and association leadership.

Our steering committee

Independent oversight, chapter review and strategic direction.

Michael Yule

Chair • Principal, Integrated Water

Spiire

Anthony Stevens

Enterprise Program Manager

Melbourne Water

Quok Ho

Principal Consultant • ALDE

Precinct Land

Ronak Rahimi

Surface Water Management Leader

Aurecon

IL

Ian Leopando

Stormwater & Drainage

Wyndham City Council

Tim Fletcher

Professor

University of Melbourne

Authority, academia, council and industry — together at the table.

PROGRESS

Where we were • where we are

SV 2025 • THEN	SV 2026 • NOW
Member engagement sessions completed	**Engagement extended - LGIDA, IPWEA IWM panel, MW 'Let's Talk' session**
VUDM framework drafted	**Final structure agreed - 7 chapters scoped**
In-principle support: MW, LGIDA, UDIA, ALDE	**Active steering committee + Chapter 4 review cycle underway**
EOI re governance issued	**Governance arrangement defined - board representation model**
Funding secured from DEECA and MW	**Chapter 4 & 5 (part) awarded and in draft • next funding stage in flight**
Chapter 4 & 5 scope agreed	**Chapter 4 draft package issued • Chapter 5 OSD methodology drafted**

Engagement across the industry

Mar 2025

LGIDA conference

VUDM session - engagement with council practitioners statewide.

Apr 2025

Member engagement sessions

Workshops with SV members to validate framework and gaps.

Jun 2025

SV 2025 Conference

VUDM progress update to the SV membership.

May 2026

IPWEA Victoria - IWM panel

Co-hosted panel with Water Studio, MW and partner authorities at PWC26.

May 2026

MW 'Let's Talk' industry session

VUDM positioning within the MW guideline landscape.

Jun 2026

SV 2026 Conference

You are here.

A new identity for VUDM

A distinct brand helps designers, councils and authorities find, trust and adopt the manual.

VUDM

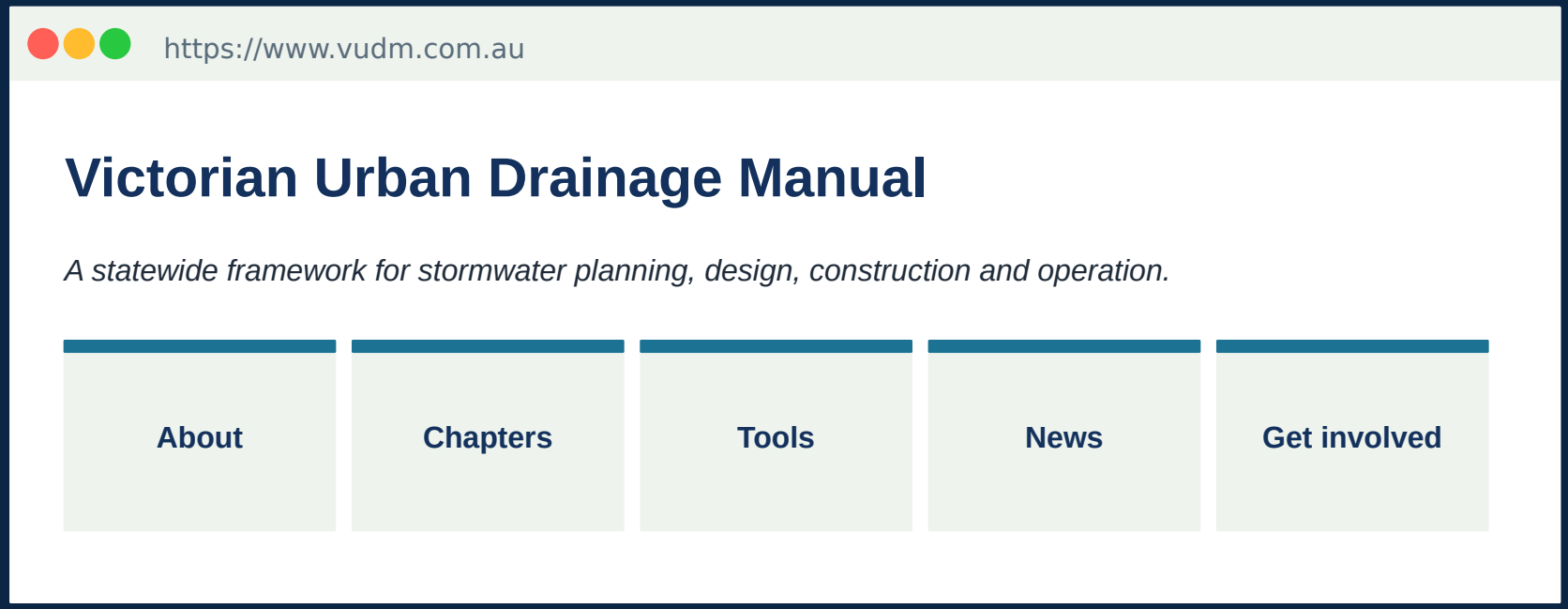
Victorian Urban Drainage Manual

Live now — featured across vudm.com.au, member comms and the manual itself.

LIVE NOW

vudm.com.au

The home for the Victorian Urban Drainage Manual.



WHAT'S THERE

- Project overview
- Working group & governance
- Chapter drafts (as released)
- SWMP tool
- News, sessions, feedback channels

VISIT THE SITE

Chapter 4 - SWMP development

Stormwater Management Plan methodology - risk-based, repeatable, supported by worked examples.

1 Initiation & scoping

- Kickoff with Working Group
- Literature review
- Gap analysis
- WG review

2 Planning & framework

- Example TOC
- Method to identify objectives
- Across all Authorities

3 Methodology & guidance

- Risk-based guidance
- High vs low risk sites
- SWMP methodologies

4 Worked example

- Hypothetical SWMP
- Step-by-step
- Used to validate the method

Status: Chapter 4 draft package issued in March 2026 • steering committee comments returned May 2026.

VUDM Chapter 4 and 5 Update

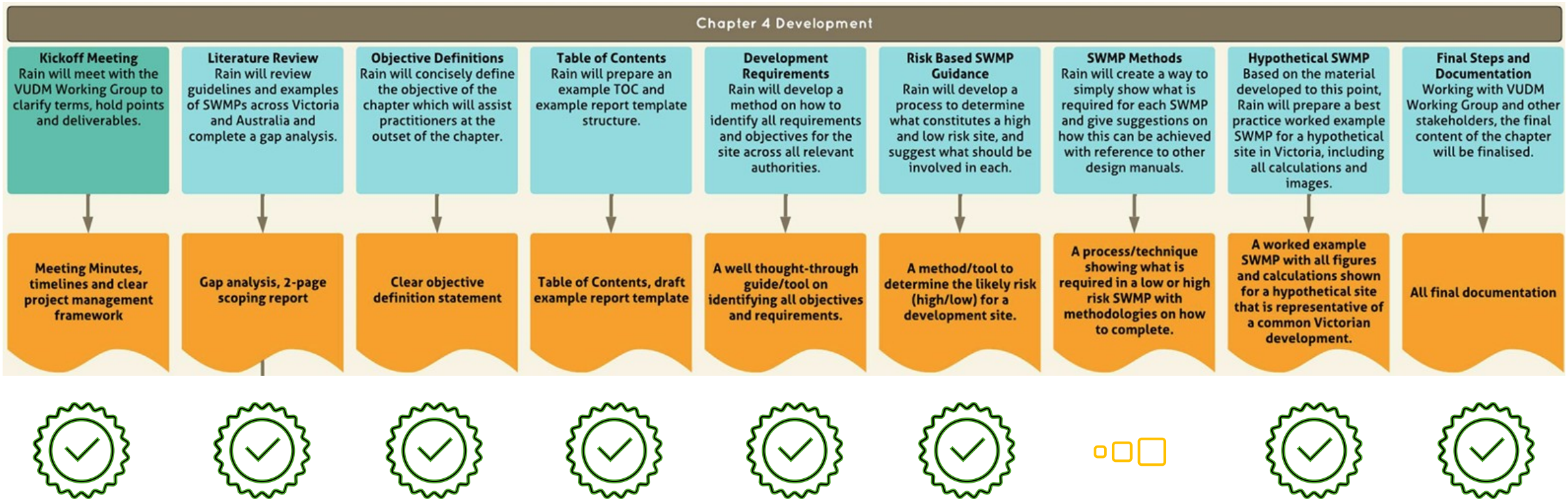
Stormwater Victoria Conference

Luke Cunningham – Director and Senior Principal Engineer

RAIN CONSULTING

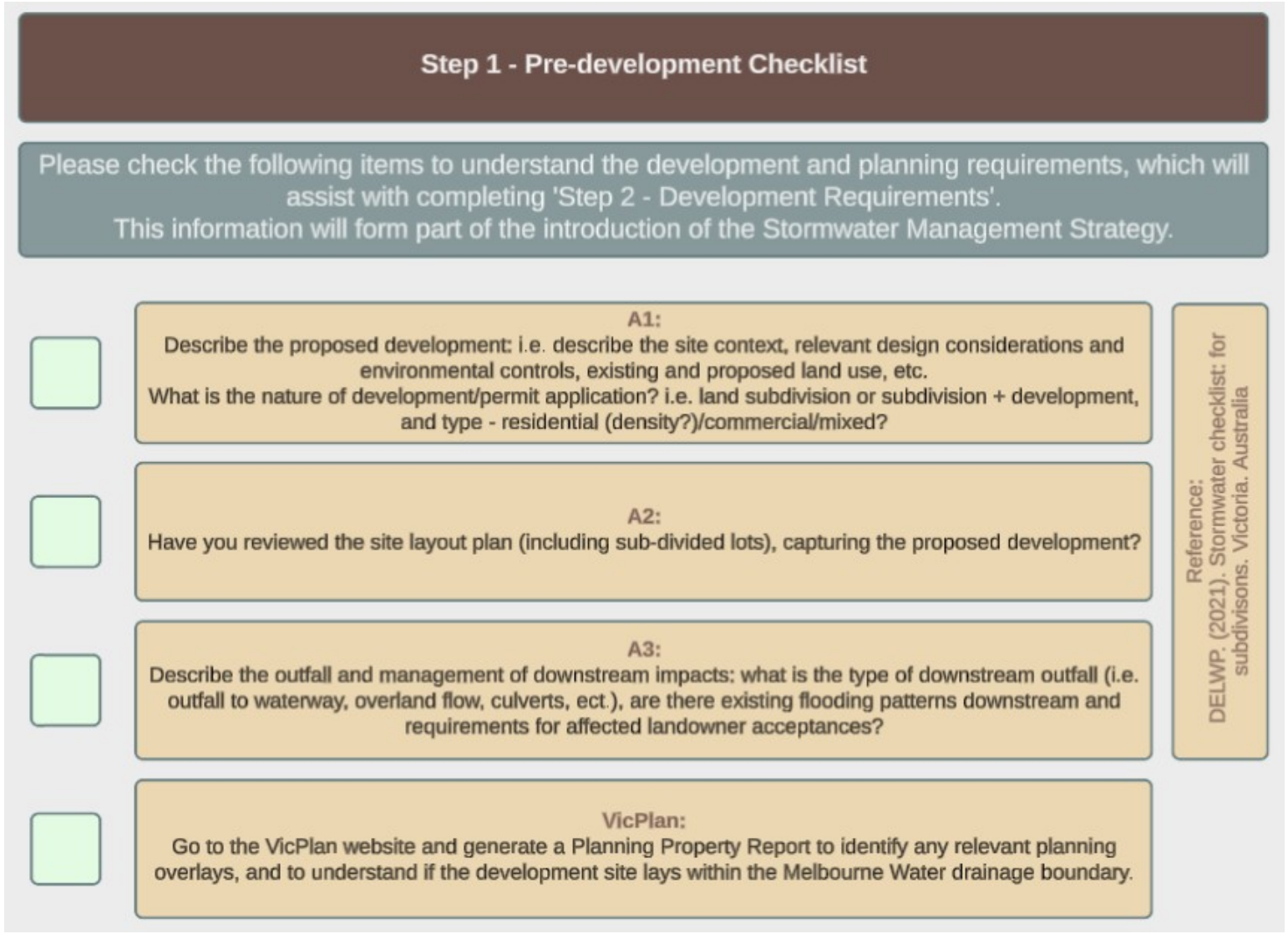
Chapter 4

Chapter 4 SWMS – Progress



- Most components completed in draft format
- In collaboration with VUDM Working Group on iteration of SWMP Methods (in progress)
- Updated draft document aimed for June-July 2026

Development Guidelines



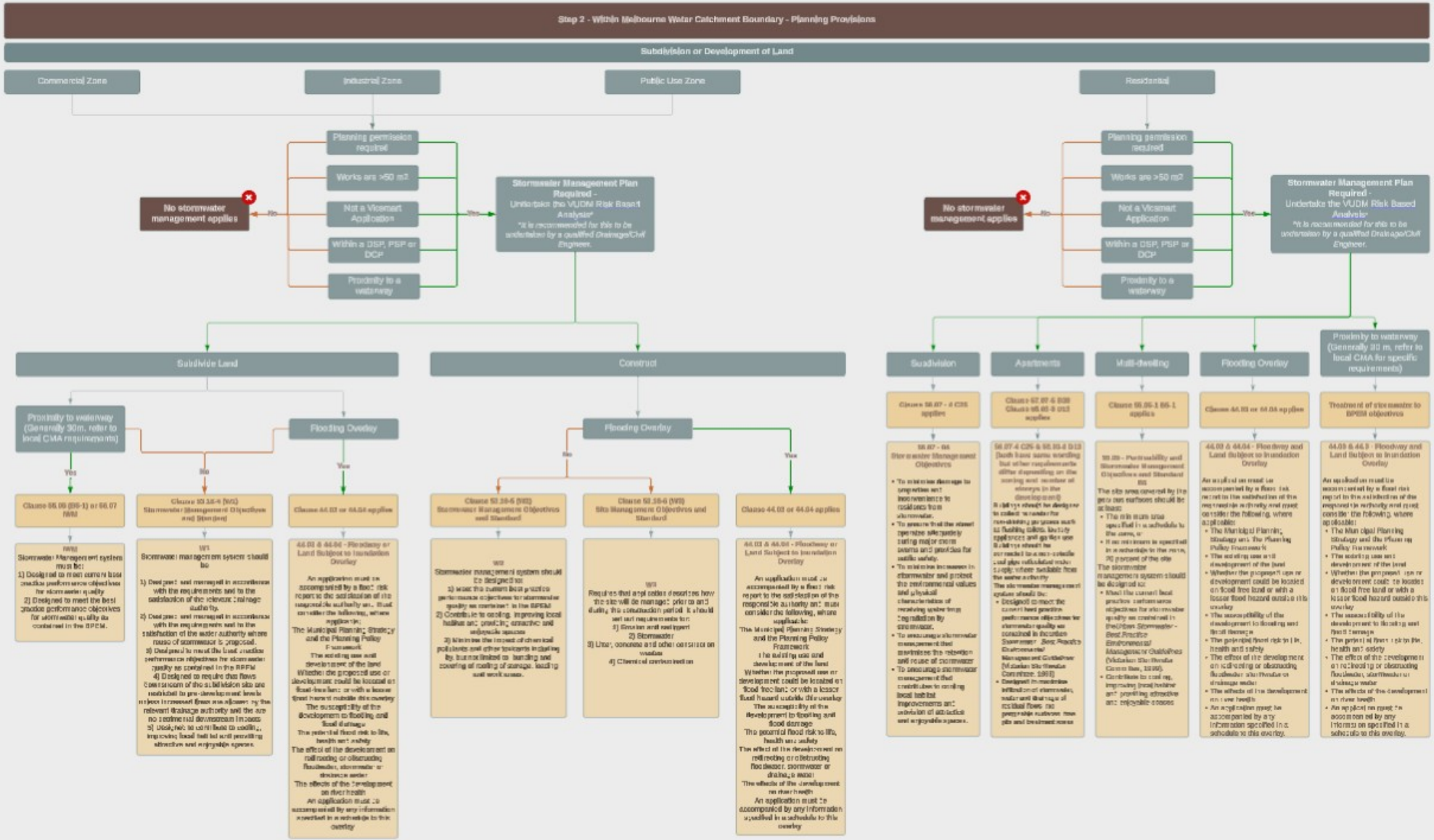
Step 1 - Pre-development Checklist

Please check the following items to understand the development and planning requirements, which will assist with completing 'Step 2 - Development Requirements'.
This information will form part of the introduction of the Stormwater Management Strategy.

- ☐ **A1:** Describe the proposed development: i.e. describe the site context, relevant design considerations and environmental controls, existing and proposed land use, etc.
  What is the nature of development/permit application? i.e. land subdivision or subdivision + development, and type - residential (density?)/commercial/mixed?
- ☐ **A2:** Have you reviewed the site layout plan (including sub-divided lots), capturing the proposed development?
- ☐ **A3:** Describe the outfall and management of downstream impacts: what is the type of downstream outfall (i.e. outfall to waterway, overland flow, culverts, ect.), are there existing flooding patterns downstream and requirements for affected landowner acceptances?
- ☐ **VicPlan:** Go to the VicPlan website and generate a Planning Property Report to identify any relevant planning overlays, and to understand if the development site lays within the Melbourne Water drainage boundary.

Reference:
DELWP. (2021). Stormwater checklist: for subdivisons. Victoria. Australia

Development Guidelines



RAIN CONSULTING

Risk Based SWMP Guidelines

- Introduces a points-based method to assess development risk (high-risk or low-risk)
- Influences complexity of SWMP
- This tool considers a range of site-specific and planning factors, including:
  - Site context and planning overlays
  - Type and scale of development
  - Drainage infrastructure complexity
  - Flood risk

Risk Based SWMP Guidelines

Site Context & Planning Overlays							
Criteria	Low-Risk SWMS	High-Risk SWMS	Supporting References	Score	Rational	High or Low Risk? *Please select from drop down options*	Rating *If 'low-risk', 0 is applied, if 'high-risk' 'score' figure is applied*
Flood Overlays (e.g. LSIO, SBO)	Site not within any overlays	Site affected by LSIO, SBO, etc	Victorian Planning Provisions (Clause 13.03, Clause 56.07), VPA PSP Guidelines	5	Flood-prone sites carry higher regulatory, hydraulic, and safety risks to not only the subject site, but also neighbouring/downstream properties.	High Risk	5
Environmental Sensitivity	Outside sensitive zones	Adjacent to waterway, RAMSAR, or water-sensitive site	Melbourne Water Guidelines (e.g. MUSIC 2024), EPA Guidelines for Urban Stormwater, Clause 14.02	4	Often requires tailored water treatment solutions, triggering the requirement for complex/detailed SWMS.	Low Risk	0
PSP/DCP/ICP Area	Not in DCP or PSP. If within PSP/DCP, no drainage asset triggers are required, and all downstream treatment / retardation / conveyance assets are constructed.	Within approved PSP or DCP with drainage schemes with drainage assets to be constructed or downstream assets are not yet in-ground.	VPA Guidelines (Engineering Design & Construction Manual, 2011)	5	Triggers precinct-level design responsibility but lower risk than flooding. However, if the precinct-level guidelines trigger the requirement for drainage assets on-site or the catchment is not yet developed, a high-risk SWMS is required to demonstrate interim and ultimate solutions.	High Risk	5
Receiving Environment	Legal point of discharge (pipe)	Discharges to waterway, wetland, or retarding basin	WSUD Engineering Procedures (Melbourne Water, 2005), MUSIC Guidelines (2024)	4	Water quality and ecological risk increase, specifically for existing receiving waterbodies which require stormwater quality/velocity/volume considerations.	Low Risk	0
					Sum		10

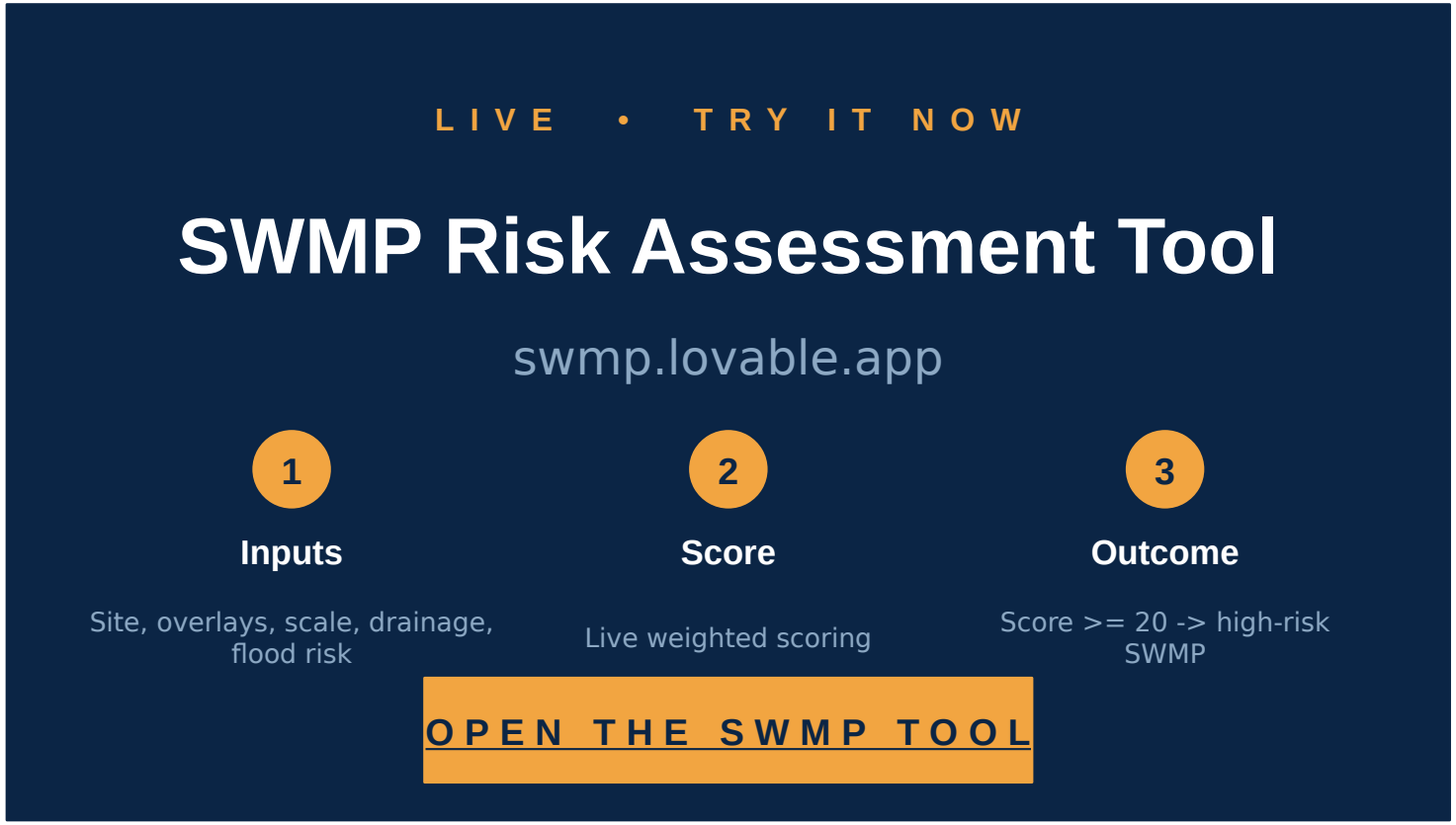
Guiding Themes

- Site Context and Planning Overlays
- Scale and Type of Development
- Drainage Infrastructure Complexity
- Flood and Hydraulic Risk

DEMO

From chapter to tool

The Chapter 4 workflow now has a working SWMP companion tool.



WHAT IT DOES

Score a site once.

Know whether you're heading for a simple or complex SWMP.

- Built off the Chapter 4 risk-based screening.
- Each criterion weighted by impact; live scoring as you toggle.
- Consistent answer across Victoria - same site, same outcome.

Hosted at swmp.lovable.app today • moves to vudm.com.au at launch.

Chapter 5

Why Chapter 5?

The chapter aims to provide practical, risk-based guidance for selecting and applying OSD methods.

The why:

- OSD practice varies significantly across Victoria
- Different councils apply different criteria and methods
- Existing guidance is fragmented
- Method selection is often inconsistent
- Small lot hydrology guidance is limited

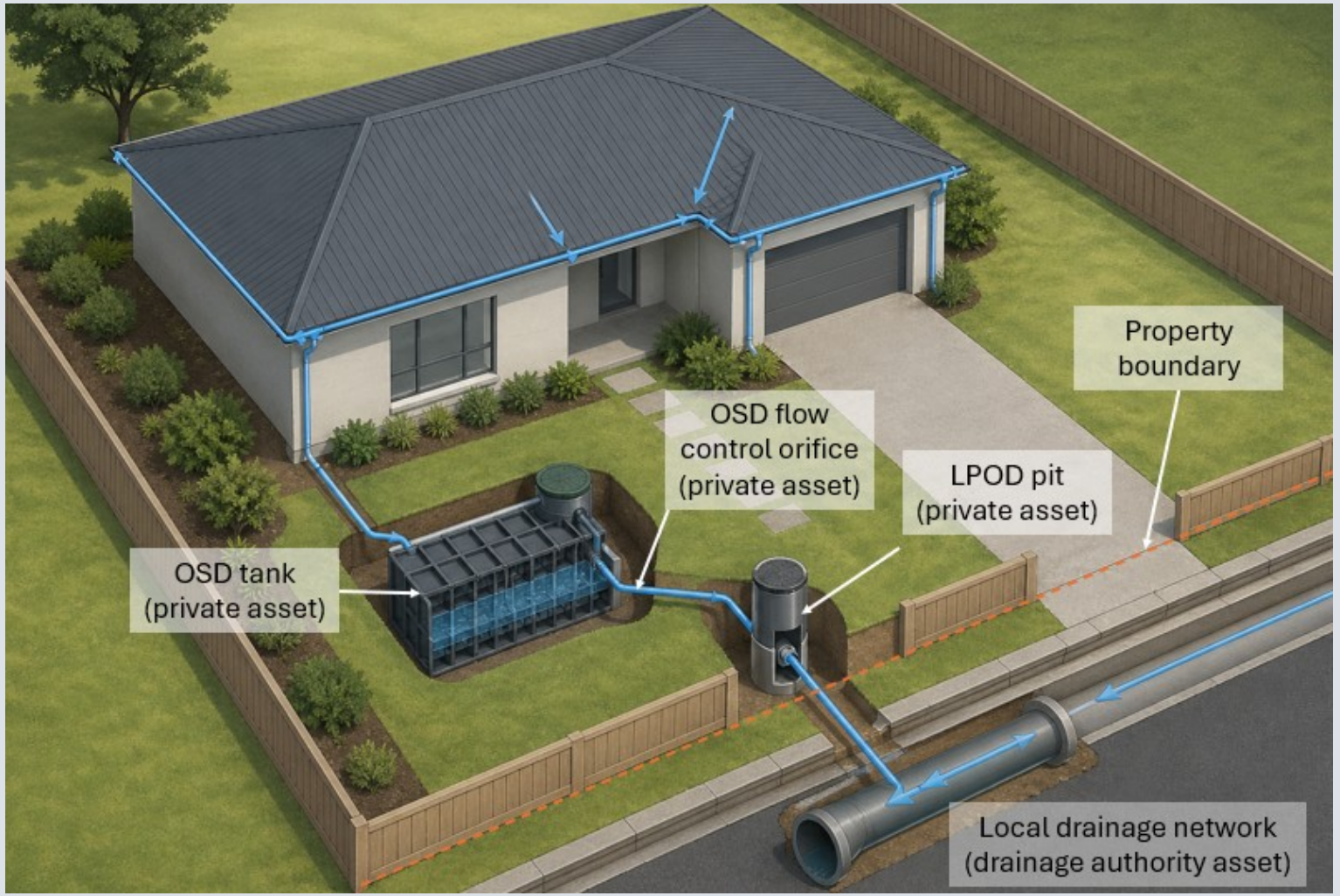
OSD = On Site Detention

What the chapter covers

Overview:

- OSD fundamentals
- Design objectives
- OSD methods review
- Method selection
- Software overview
- Design considerations
- Small lot hydrology

Focus is on practical application and proportionality.



Core philosophy

No Single Method Fits Every Site

Method selection should reflect:

- Scale
- Risk
- Downstream sensitivity
- Upstream influence
- Required level of confidence

Key Messages:

Simple sites do not need complex models

Complex sites should not rely on oversimplified methods

Overview of OSD Methods

- Rational / simplified methods for very small sites
- Boyd method for small developments
- Swinburne method where timing matters
- Time-area methods for hydrograph generation
- Integrated modelling for complex/high-risk sites

Method	Typical Application Scale	Risk Level Suitability	Key Strengths	Key Limitations	When to Use	When Not to Use
Simplified Methods (Rational-based, spreadsheet approaches)	▸ Very small sites, ▸ Individual lots, ▸ Simple infill developments.	Low risk	▸ Very simple, ▸ Low data and effort requirements, ▸ Rapid assessment	▸ Does not represent hydrograph shape, ▸ Does not identify the critical storm duration governing storage requirements; ▸ Does not account for the influence of loading of events, ▸ Sensitive to Tc; ▸ Very simplified storage behaviour.	▸ To sense check other methods. ▸ Best not to use this as the primary method where other simple methods are available. ▸ Otherwise, very small, low-risk sites with simple drainage and limited downstream constraints.	▸ Larger than lot-scale development ▸ Moderate risk sites, ▸ Where there are upstream or complex catchments, ▸ Where timing or routing is important.
Boyd Method	▸ Small to moderate developments ▸ Preferred range is generally up to ~5ha. ▸ Limited upstream influence	Low to moderate risk	▸ Widely used, ▸ Considers storm duration, ▸ Adaptable to routing approaches	▸ Simplified hydrograph shape and outflow assumptions; ▸ May require adjustment to account for non-linear storage–discharge behaviour (e.g. conservative discharge assumptions or reduced PSD). ▸ Limited representation of non-linear behaviour ▸ No consideration of catchment-wide effects.	▸ Standard lot and small subdivision design; ▸ Relatively simple hydrologic conditions	▸ Complex or high risk sites ▸ Where detailed hydrograph behaviour is required ▸ Where catchment wide effects need to be considered
Swinburne Method	▸ Small to moderate developments with upstream	Low to moderate risk	▸ Widely used ▸ Multiple existing simple software available	▸ Higher data needs – including needing to know more about the greater catchment ▸ Based on simplified hydrology;	▸ Sites with upstream catchment influence; where	▸ Complex systems; ▸ Sites requiring detailed

Worked Examples

3 Calculate PSD

For this example, we will calculate the PSD for an above-ground storage option.

$$PSD = \frac{a - \sqrt{a^2 - 4b}}{2}$$

$$a = \left(\frac{2Q_a}{t_c}\right)\left(\frac{2t_cQ_p}{3Q_a} + 0.75\,t_c + 0.25\,t_{cs}\right)$$

$$b = 2Q_aQ_p$$

Take 30min storm as an example:

- $t_c = 30\text{min}$
- $t_{cs} = 12\text{min}$
- $Q_a = 0.341\text{m}^3/\text{s}$
- $Q_p = 0.730\text{m}^3/\text{s}$

Calculate a

$$a = \left(\frac{2 \times 0.730}{30}\right)\left(\frac{2 \times 30 \times 0.341}{3 \times 0.730} + (0.75 \times 30) + (0.25 \times 12)\right)$$

So:

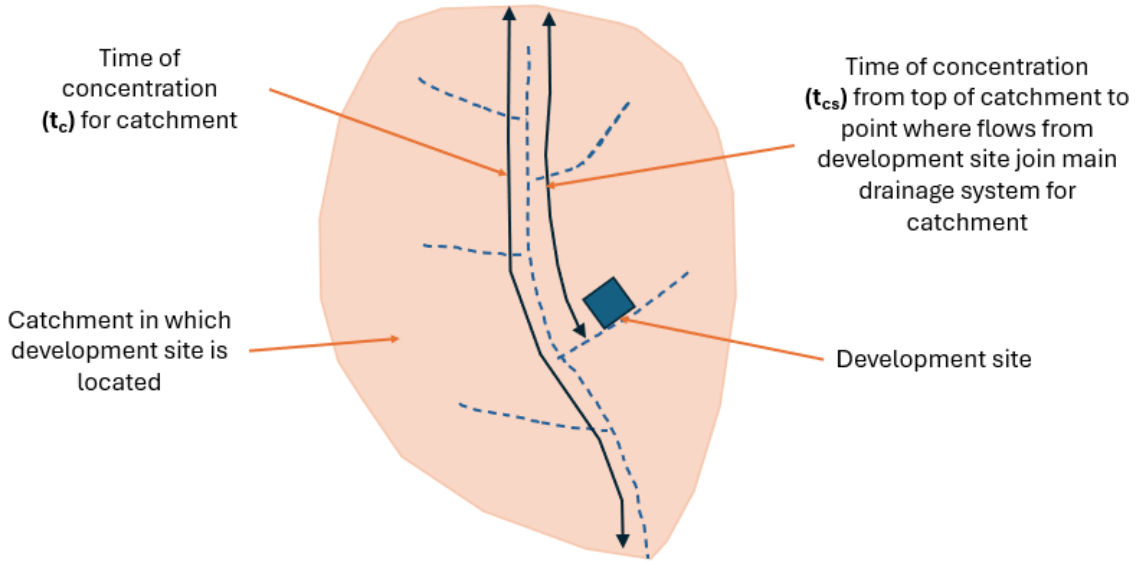
$$a = 1.695$$

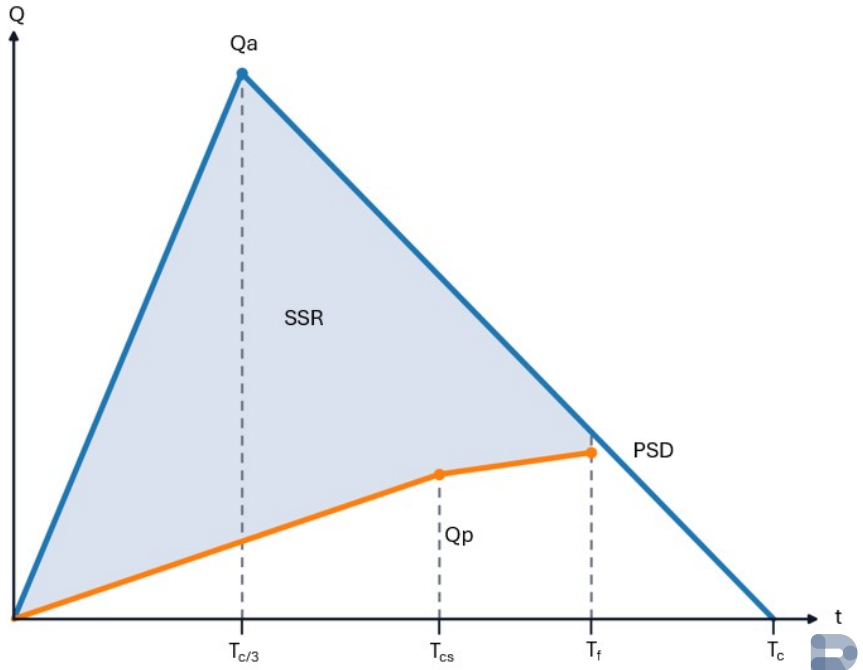
Calculate b

$$b = 2Q_aQ_p = 2 \times 0.341 \times 0.730 = 0.497$$

Calculate PSD

$$PSD = \frac{1.695 - \sqrt{1.695^2 - (4 \times 0.497)}}{2} = 0.377\ \text{m}^3/\text{s}$$

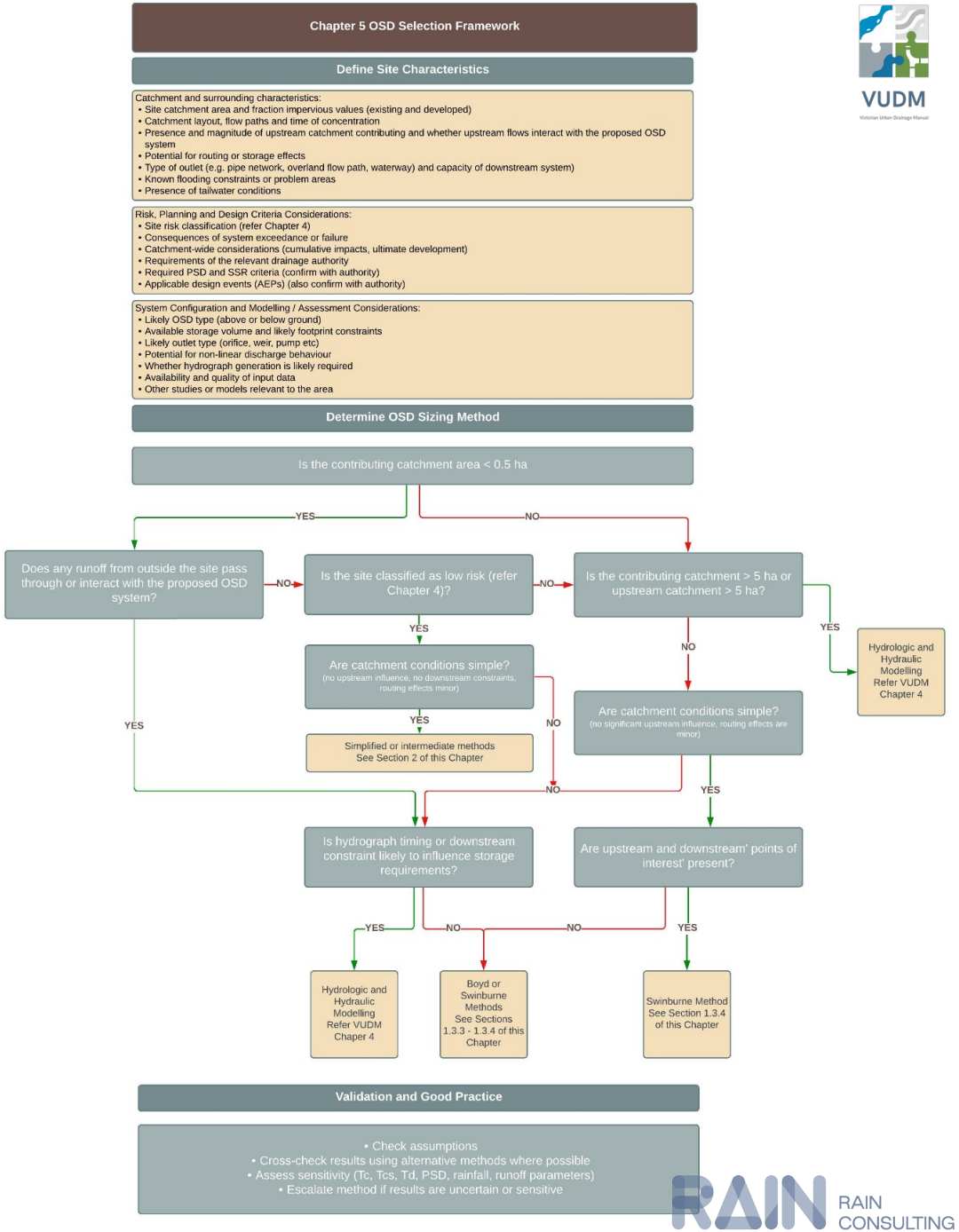




Method Selection

The selection of an appropriate OSD method process:

- Define the contributing catchment area and development scale
- Assess site risk in accordance with Chapter 4
- Identify whether upstream catchment influence or downstream constraints are present
- Determine whether hydrograph timing and routing are likely to influence storage requirements
- Select an appropriate method based on Table 1



Software Landscape

- A suite of software is available.
- Selection should reflect required processes, risk and cost / investment

Software	Method(s)	Risk Level Suitability	Key Strengths	Key Limitations	Cost / Accessibility
InSite	• Swinburne • Boyd's	Low to moderate risk	• Processes informed by ARR2019 • Can use same software to consider WSUD and water reuse • Streamlined focus on OSD workflow	• Tailored to sites less than 6.5 ha • Not suitable for full network hydraulic modelling • High data input requirements for full functionality	• Cloud based-access • Low to moderate cost
OSD4	• Swinburne	Low to moderate risk	• Widely used and historically accepted • Simple and quick application	• No longer supported by the developer and unavailable for purchase • Limited flexibility and transparency • Not suitable for complex or integrated designs	• Legacy software, no longer commercially available
Structural Toolkit (v5.5)	• Swinburne	Low to moderate risk	• Processes informed by ARR2019 • Simple spreadsheet interface • Adjusted SSR calculations for different types of underground structures	• Typically, applicable to smaller developments • Seems to produce lower volumes (less conservative SSR relationships) compared to other Swinburne software.	• Moderate cost • Easy to use interface
OSDS4VIPS	• Swinburne	Low to moderate risk	• Adopts Swinburne approach as implemented in the widely used OSD4 software updated to use 2016 IFDs • Processes informed by ARR2019 • Focus on OSDs • Option to generate a full OSD design summary report outlining inputs and outputs clearly	• Limited available documentation • Lack of widespread acceptance/understanding • Not suitable for full network hydraulic modelling	• Pay per use, hence variable cost
DRAINS	• Time-Area (or	Low to high	• Processes informed by	• Data intensive and need for accurate information when	• Moderate to high cost

Emerging Considerations

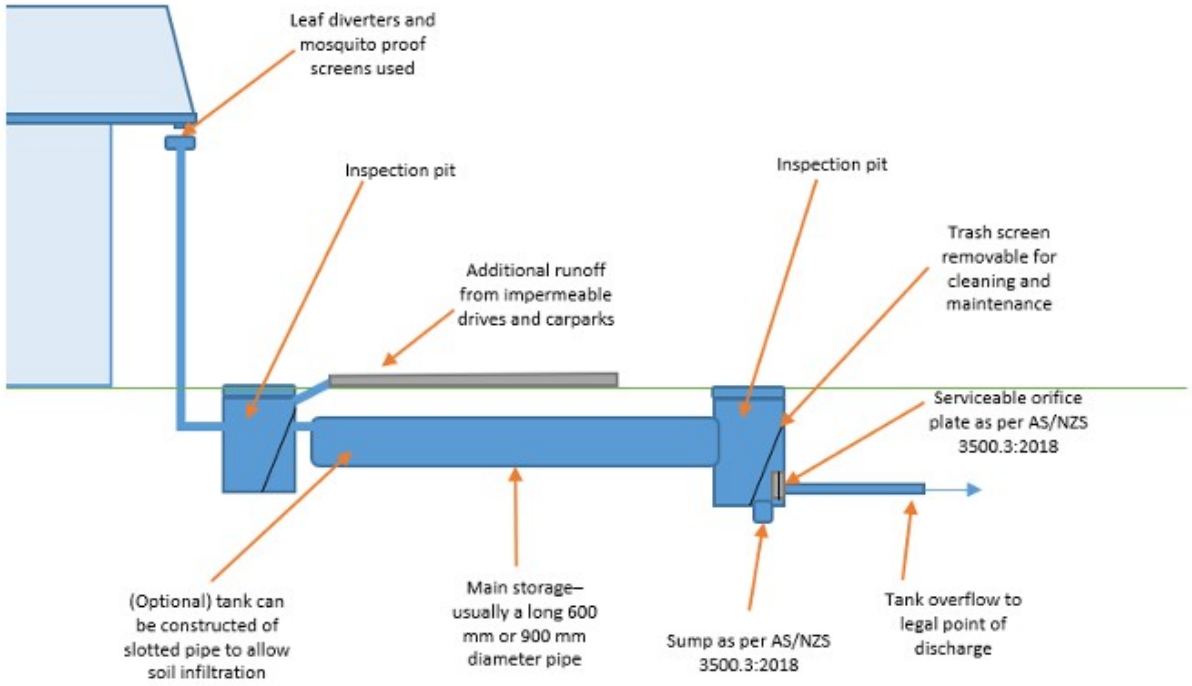
- Peak flow control alone may not address all drainage impacts
- Climate change may alter historical assumptions
- Growing need for runoff retention (OSR) and volumetric control
- Integration of OSD and OSR concepts

Future drainage outcomes may require both peak and volume control approaches.

Practical Design Considerations

Covers:

- Integration into site layout, early concept planning, drawings guidance, overflow management, freeboard, outlet blockage, maintenance access.



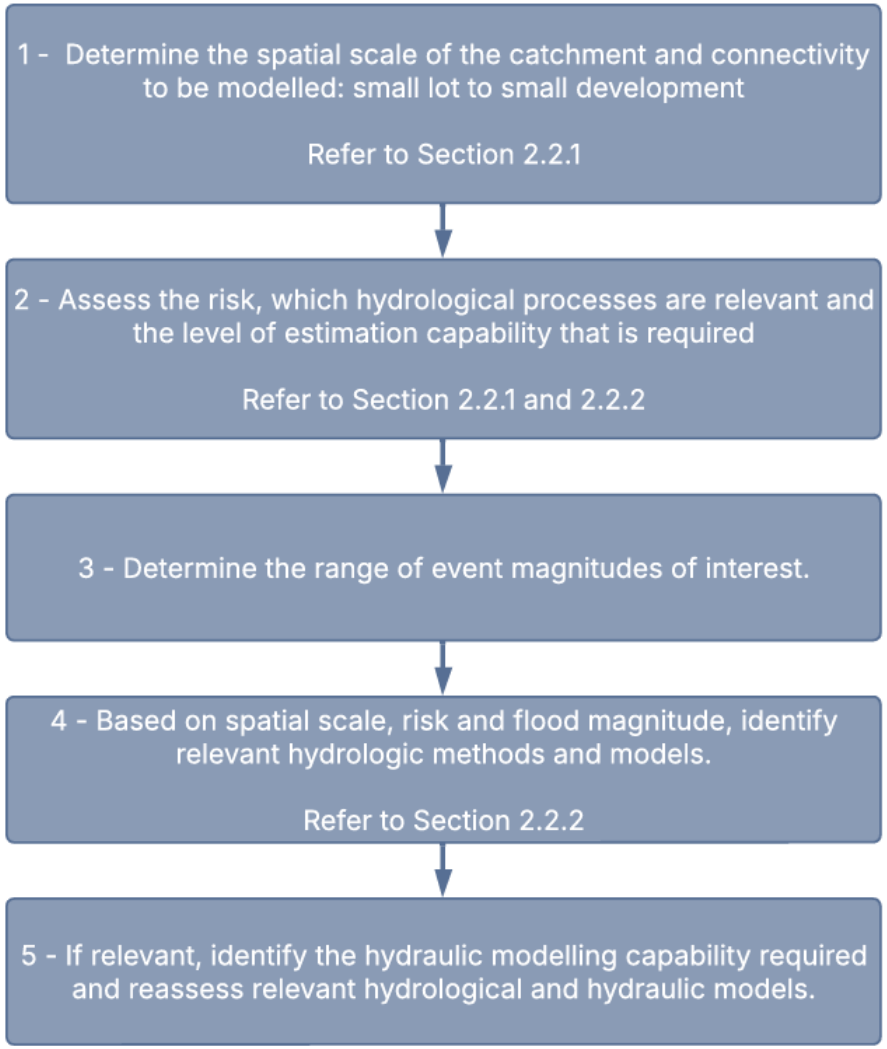
Small Lot Hydrology

Method selection by scale and risk

Scale / Condition	Typical Catchment Size	Recommended Method	Applicability / Notes
Very small, low-risk site	< 0.25 ha	Rational Method-based or authority-based approach.	Suitable where there is no upstream influence, no downstream constraint and no routing requirement. Typically used for single dwellings or minor developments. RORB or DRAINS is generally not recommended because the model setup is unlikely to add value at this scale and risk level.
Small lot	0.25 ha to 1 ha	Rational Method based or simple hydrograph method (eg time-area method in DRAINS or equivalent)	Rational Method may be used for peak flow estimation. Hydrograph modelling (such as in DRAINS) is preferred where hydrograph generation or OSD routing is required.

Model Approaches, Software and Process

Aspect	Network-Based Urban Drainage Tools (e.g. DRAINS, InfoWorks, SWMM)	Runoff-Routing Models (e.g. RORB, URBS, WBNM, RAFTS)
Primary application	Urban drainage systems and OSD design	Catchment runoff generation and routing
Best suited to	Small urban catchments with storage and network interaction	Larger or upstream catchments where routing governs response
Hydrograph representation	Explicit hydrographs with local timing and storage	Explicit hydrographs with catchment routing and lag
Hydraulic / network behaviour	Represented (pipes, pits, surcharge, storage)	Not represented
Data requirements	High. Requires detailed definition of sub-catchments, pipe network, pits, levels, and storage geometry	Moderate. Requires catchment layout, subarea delineation, and routing parameters
Strengths	OSD design, system interaction, timing effects	Catchment response, routing and lag
Limitations	Can be unnecessarily complex for simple sites. False precision if model inputs and network assumptions are poor.	Not suitable for detailed urban drainage behaviour. Misuse as a hydraulic model, or poor parameter/subarea justification.
When to use	Storage, timing or drainage network behaviour is important	Upstream routing or catchment processes dominate
When not to use	Not suited to catchments where large-scale routing dominates and detailed drainage system representation is not required.	Not suited where drainage system behaviour (pipes, pits, storage, surcharge) governs outcomes.



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What's next

Now -> Sep 2026	**Finalise Chapters 4 & 5** Close out review cycle, integrate steering committee feedback, publish final drafts.
Q3 2026	**Website and SWMP tool live** Publish vudm.com.au and the SWMP companion tool for broader practitioner use.
Q4 2026	**Fill board and steering committee** Confirm board representatives and remaining steering committee seats.
Q4 2026 -> Q1 2027	**Secure next-stage funding** Commission the remaining chapters (1, 2, 3, 6, 7) under the same delivery model.
2027	**Roll-out and training** Subscription model, training pathways, ongoing maintenance and update cycle.

CALL TO ACTION

What we need from you

01

Contribute to governance

EOIs open for board and steering committee seats.

02

Bring technical expertise

Review draft chapters and shape worked examples.

03

Attend industry sessions

Workshops, panels, engagement events through 2026.

04

Ongoing feedback

Tell us what works on real projects. We will iterate.

GET INVOLVED

Help shape the manual our industry needs.

Join the working group

Sign up via Stormwater Victoria.

office@stormwatervictoria.com.au

Send queries and ideas

Direct to the president's desk.

president@stormwatervictoria.com.au

Follow progress

Project updates and chapter releases.

www.vudm.com.au

Questions?

Thoughts, push-back and offers to help - all welcome.

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