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# The Challenges of Water Resources Management on P3 Projects

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# Presenters

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# About the Presentation

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- ▶ This presentation looks at the role of the partners in a Public-Private Partnership (P3) relative to environmental compliance during design and implementation.
- ▶ The focus will be centered on the challenges of water management and the need for developing control plans from partial designs and for non-sequential construction works.



# What is a P3?

- ▶ Public – Private Partnerships (P3s) are:
  - ▶ Performance-based approach to procuring public infrastructure
  - ▶ Spreads the risk in terms of financing and construction between the partners
  - ▶ Leads to effective implementation of infrastructure, from design and planning to long-term maintenance.



# What is a P3?

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- ▶ In practical terms, this means that:
  - ▶ Governments do not pay for the asset until it is built;
  - ▶ The costs are known upfront and span the life-cycle of the asset
    - ▶ Taxpayers are not on the financial hook for cost overruns, delays or any performance issues over the asset's life.
    - ▶ The cost of the infrastructure is paid over the life of the asset and only if it is properly maintained and performs according to specifications

# P3 Challenges

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- ▶ The Private partner's role may present complications or risks relating to environmental approvals.
- ▶ Difference in expectations and contract interpretations by partners can create challenges for environmental controls
- ▶ Additional financial repercussions (lenders) – payment milestones may conflict with “regulatory” schedule
- ▶ Potential conflicts with the project agreement schedule





# P3 Challenges

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- ▶ The role of the Private partner varies between projects
  - ▶ Can include some or all of design, build, finance, operate and maintain
- ▶ The elements that are included in the P3 agreement have implications on the implementation, schedule and expectations





# P3 = Large Infrastructure



Large Complex  
Projects

# Just in Time Delivery

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- ▶ “Just in Time” design and approval framework is commonly applied.
- ▶ Maintaining project schedule:
  - ▶ Expedited environmental approvals
  - ▶ Designing / implementing environmental controls
  - ▶ Avoiding potential regulatory action
- ▶ Challenge!
  - ▶ Construction works scheduled with partial or incomplete designs and/or approvals.

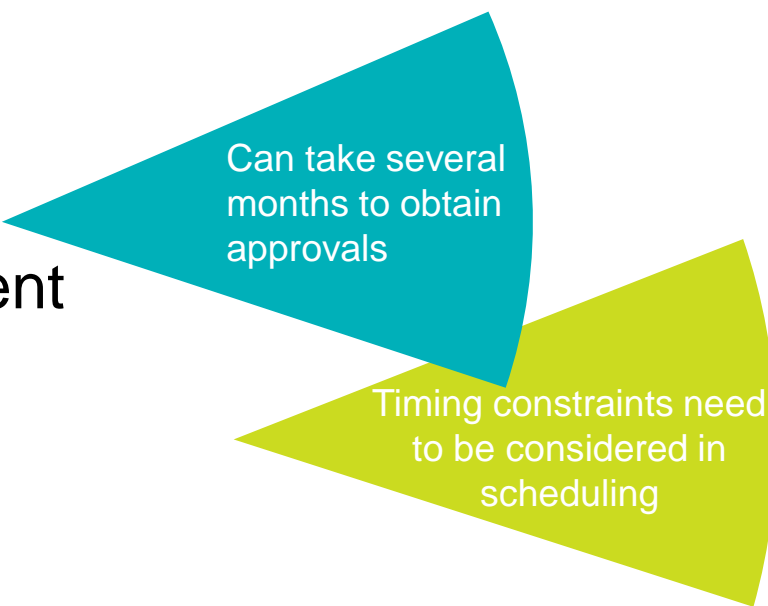




# Environmental Approvals

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- ▶ Numerous environmental aspects need to be considered at the approvals stage
  - ▶ Water diversions
  - ▶ Water quality standards
  - ▶ Groundwater Management
  - ▶ Fisheries
  - ▶ Wetland Policies
- ▶ Challenge!
  - ▶ Under P3 arrangement either the contractor and/or the public partner can be the proponent for environmental approvals.



Can take several months to obtain approvals

Timing constraints need to be considered in scheduling

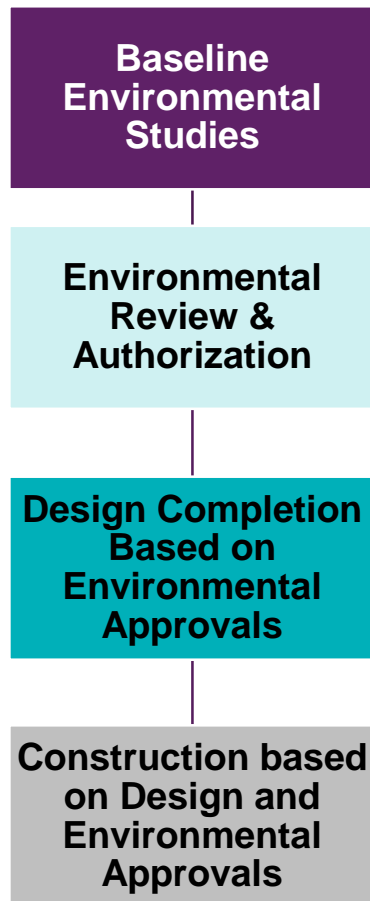
# Environmental Approvals

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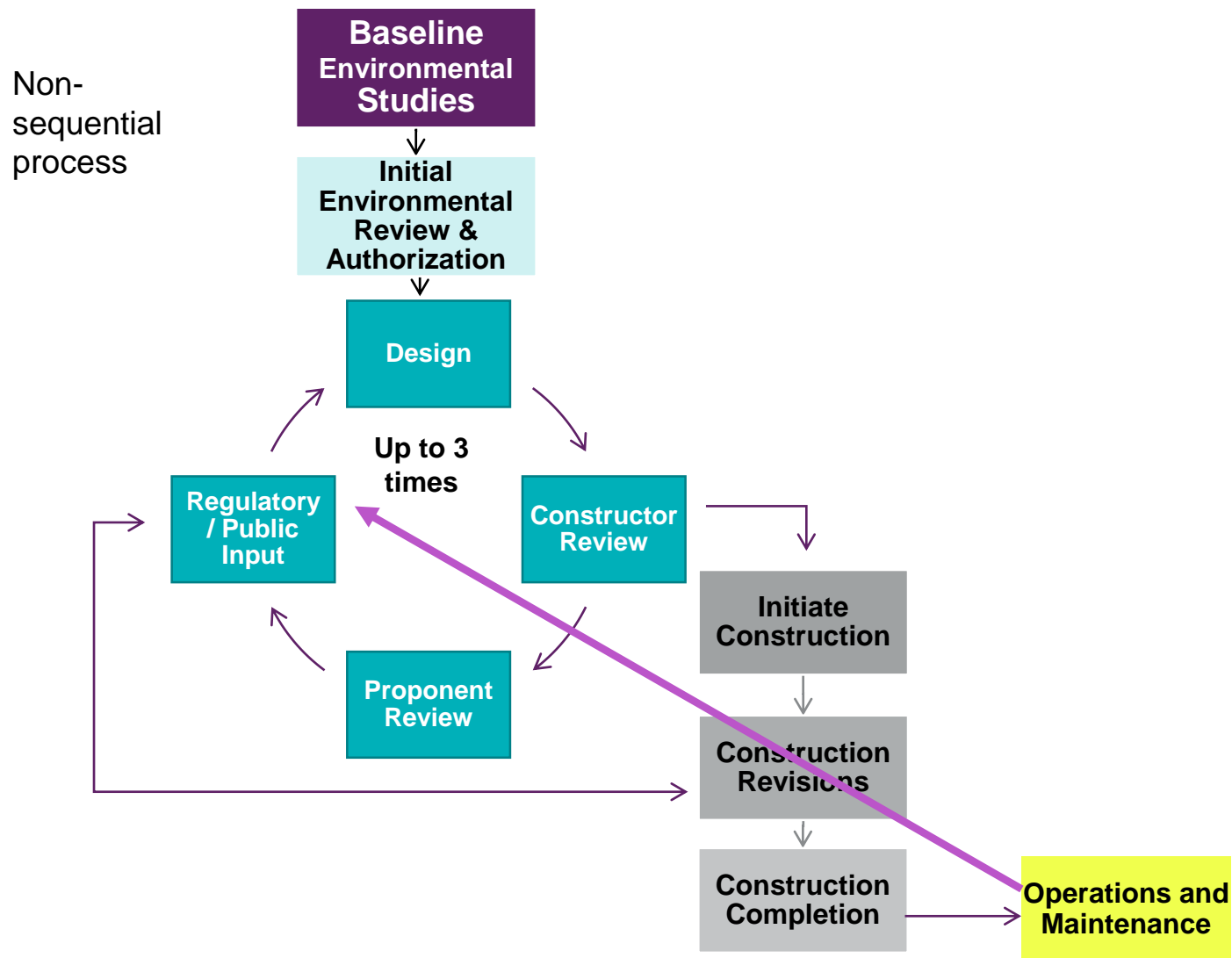
- ▶ Where public partner is the proponent, differing expectations can create challenges
  - ▶ Who works with the regulator?
  - ▶ Who's legally responsible?
  - ▶ How does the public partner ensure appropriate implementation?
- ▶ Elements of approvals may be the responsibility of different the partners
  - ▶ Contractual arrangement must be defined and referred to through the life of the project
  - ▶ Laws change, who's responsible for cost implications and implementation?
- ▶ The Owner may have a number of standards for maintaining environmental controls
  - ▶ Are these controls applicable / required for P3 works?

# Standard Regulatory Regime chart

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# P3 Regulatory Regime chart



# Compliance at Design Stage

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- ▶ Integrated design process with design and construction teams
  - ▶ Design refinements can have an impact on construction and approvals
- ▶ Design should accommodate staging of works to meet water management goals
  - ▶ Does the design incorporate permanent and temporary controls?
- ▶ Challenge!
  - ▶ Stakeholder engagement early can help maintain compliance as construction activities commence.





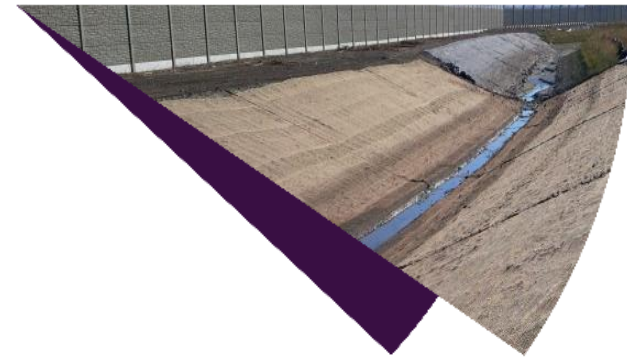
# Stakeholder Engagement

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- ▶ Establishment of environmental core agency consultation groups early in design stage.
- ▶ Allows multiple regulators / stakeholders to be involved through plan development.
- ▶ Creates partnership attitudes that can accommodate more flexibility and understanding of challenges and expectations

Formal &  
informal





The diagram illustrates a typical 5m floodplain plan. It shows a central channel with a centerline and top-of-channel boundaries. The channel width is indicated as 1750. The floodplain extent is shown on both sides, with a minimum width of 500. The total width of the floodplain is indicated as 5000. The diagram also shows the top of the drainage pathway and the top of the bank varies. A rock riffle grade control structure is shown in the center of the channel, with a typical width of 1750. The structure is labeled 'TYPICAL ROCK RIFLE GRADE CONTROL'. The diagram includes dimensions for the structure's width (1750) and the distance from the structure to the floodplain extent (17500 TO 18500). The diagram is titled 'TYPICAL 5m FLOODPLAIN PLAN' and has a scale of 1:100.

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# Compliance at Implementation Stage

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- ▶ Focus of constructor will be centered on advancing construction to meet schedules, key milestones, etc.
- ▶ Challenge!
  - ▶ Water management and control plan development needs to consider partial designs and non-sequential construction schedules.

Establish standards for control measure implementation early



# Establishment of Environmental Standards

- ▶ Clear communication of expectations to contractors
- ▶ Vision of erosion controls
  - ▶ Risk tolerance may be differing between the partners.
  - ▶ Erosion and Sediment Control Plan/Environmental Protection Plan Development early in project.
- ▶ Challenge!
  - ▶ Water management, temporary storage
  - ▶ Early construction of stormwater management ponds

Sediment  
Controls



End of Pipe  
Treatment







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# Stormwater Management During Construction

Stormwater  
management.  
Early construction  
of ponds for water  
management.



# Contractor Responsibilities

- ▶ Clear definition of responsibilities in contract documents
- ▶ Development of operational control documents
  - ▶ Include in all contractor contract packages
- ▶ Challenge!
  - ▶ Defined responsibilities for installation and maintenance of environmental controls

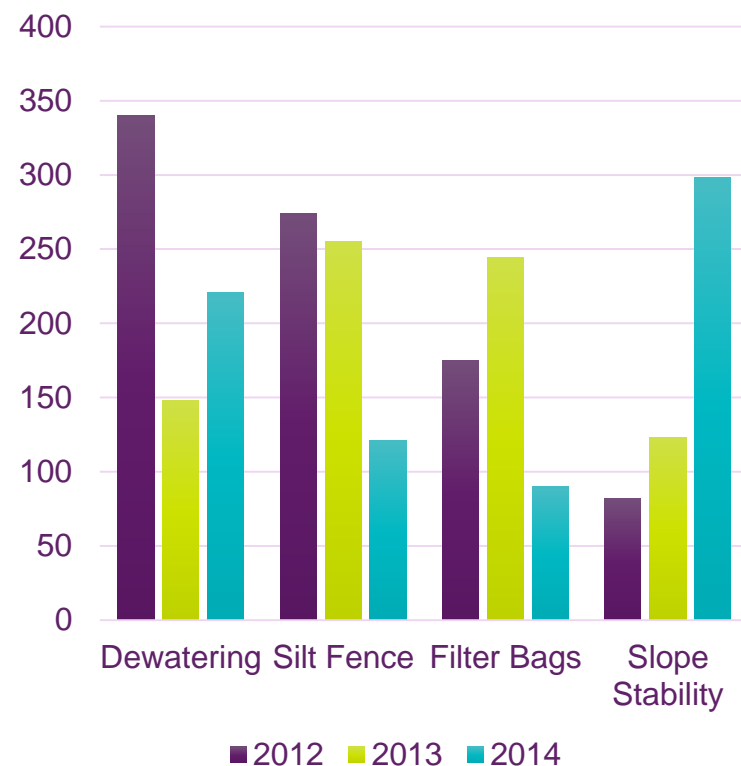
## SPECIAL PROVISION WATER MANAGEMENT

REVISION HISTORY					
REVISION	DATE	STATUS	PREPARED	REVIEWED	APPROVED
0	12/18/2013	ISSUED FOR CONSTRUCTION	AL	PAM	RPB
1	01/22/2014	ISSUED FOR CONSTRUCTION	AL	PAM	RPB

# Environmental Monitoring

- ▶ Establish environmental construction monitoring program with clear communication of action items to contractors.
- ▶ Tracking environmental inspection
  - ▶ Identify issues
  - ▶ Evaluate reoccurrence
  - ▶ Trigger adaptive management

## Environmental Inspections





# Adaptive Management

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- ▶ Adaptively managing compliance in a rapidly changing setting is required.
  - ▶ Regular meetings between all parties
    - ▶ Sub-contractors
    - ▶ Public Partner
    - ▶ Environmental Regulators
    - ▶ Stakeholders



# Watercourse Realignment





# Environmental Reporting

- ▶ Monitoring of approval / regulatory requirements
  - ▶ Supporting documentation
  - ▶ Timely submission to regulators
- ▶ Reporting project agreement compliance
  - ▶ Milestone achievements
  - ▶ Close out
- ▶ Documenting of environmental incidents

Use of Mobile  
Applications



# Lessons Learned from these Challenges

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- ▶ Understand structure of P3 partnership and responsible parties
- ▶ Recognize environmental considerations in schedule development
- ▶ Understanding of iterative design elements
- ▶ Stakeholder engagement early and throughout the project
- ▶ Communication of environmental responsibilities to contractors and subcontractors
- ▶ Establishment of environmental compliance monitoring program
- ▶ Incorporation of adaptive management in environmental protocols

