

REDESIGN AND RECONSTRUCTION OF STORMWATER OUTFALLS



Steve Adams, Engineering

REDESIGN AND RECONSTRUCTION OF STORMWATER OUTFALLS

- Background
- Morey's Landing
- Rivergreen
- Lessons Learned



REDESIGN AND RECONSTRUCTION OF STORMWATER OUTFALLS

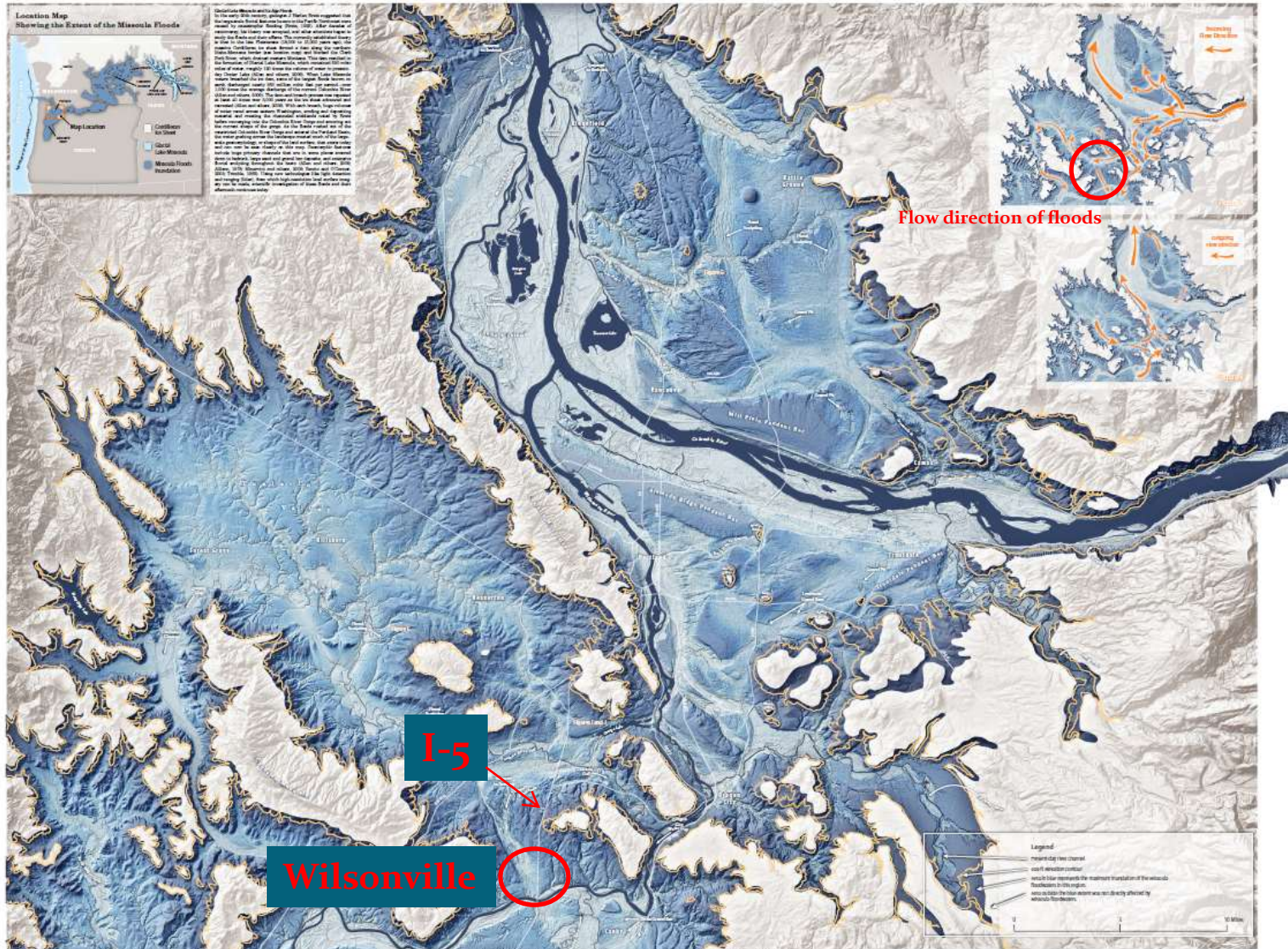
- Impacts from stormwater and the Willamette River
- Soils and geotechnical factors
- Coordination with property owners
- Permitting (Army Corps, DSL, NMFS)



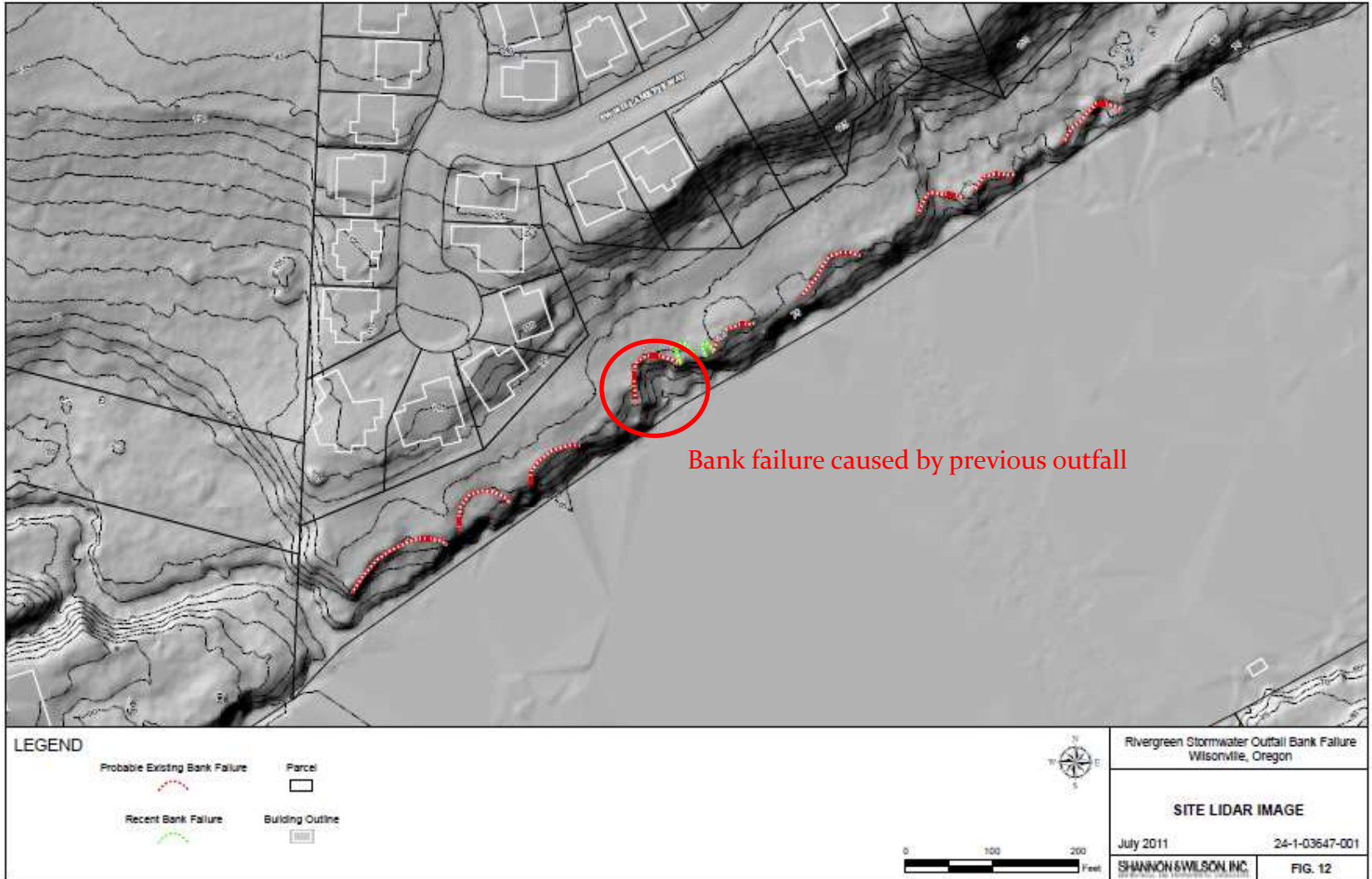
STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
Water Chapter
1000 NE Oregon Street, Suite 1000
Portland, Oregon 97232
Phone: 503-725-3300
Fax: 503-725-3301
www.oregon.gov/DEQ/DMIS

Missoula Floods — Inundation Extent and Primary Flood Features in the Portland Metropolitan Area

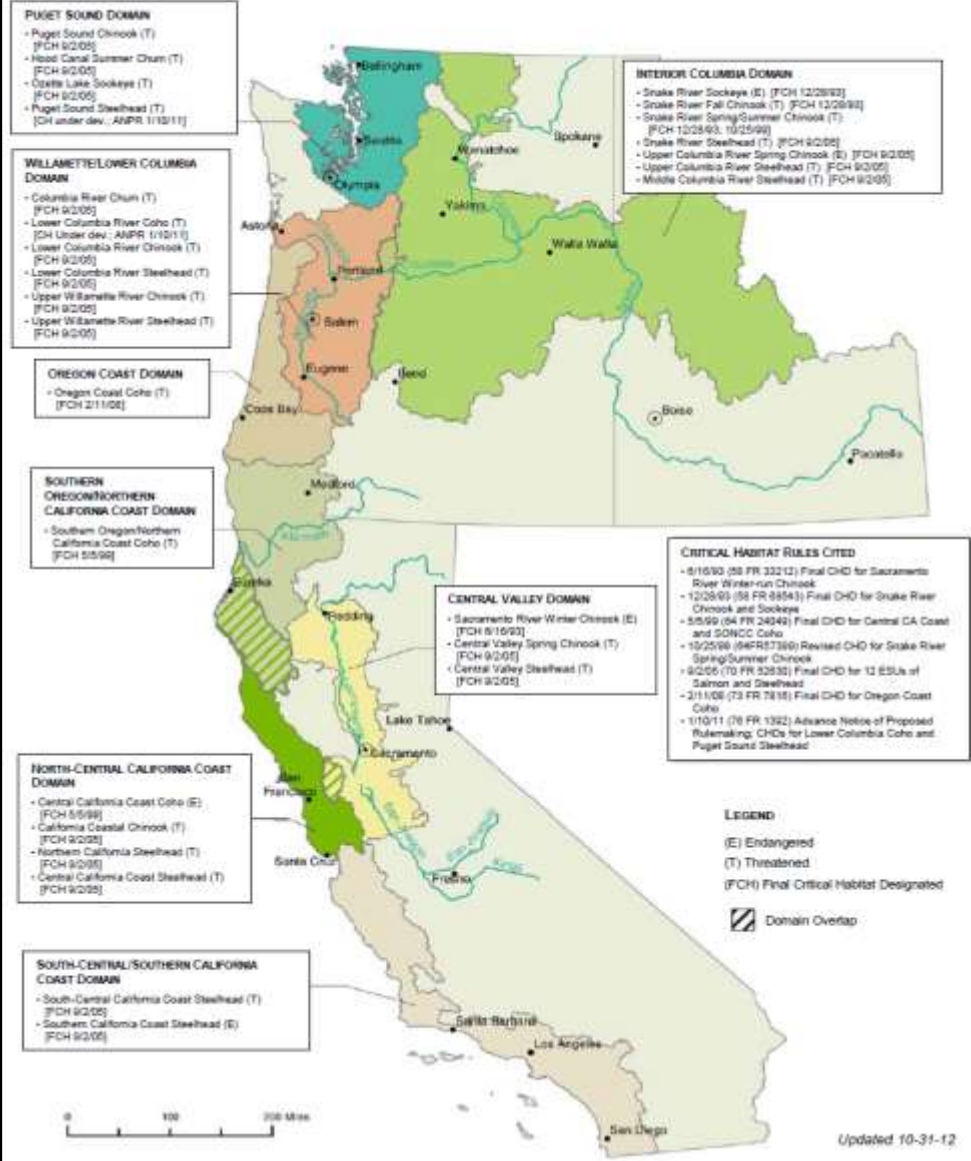
2012



Historical landslide events along north bank of the Willamette River



Status of ESA Listings & Critical Habitat Designations for West Coast Salmon & Steelhead



Permitting

- Joint Permit Application – Army Corps, DSL
- Biological Assessment/Biological Opinion – NMFS
- Construction Limitations (In-water work period)
- Mitigation
 - Below OHW (Logs and root wads, plantings)
 - Above OHW (Riparian area plantings, stormwater treatment)

Morey's Landing July 2011 - First Call

A very industrious homeowner
working without permits



Morey's Landing

Temporary measures approved by
Army Corps of Engineers –
constructed October 2011



Headwall



Energy dissipater

Morey's Landing



Basin sizes:

Main Storm Outfall: 26 ac.

West Minor Outfall: 2.5 ac.

East Minor Outfall: 6.5 ac.



Morey's Landing

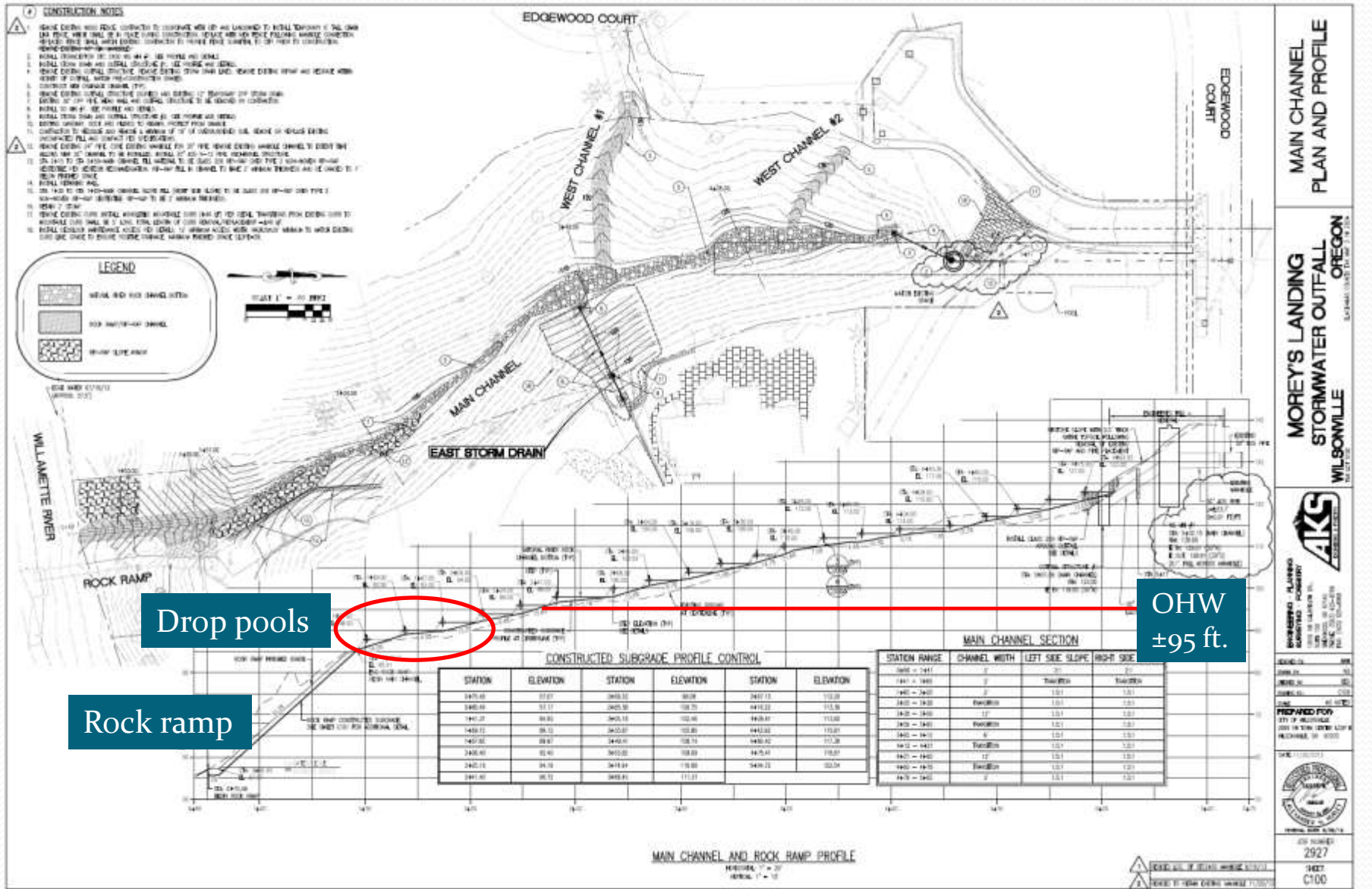
Difficult site access

- Storm channel ringed by private property
- Access taken from SS lift station driveway - build from bottom up
- Very limited staging area for storage of material



Morey's Landing

Project Design



MAIN CHANNEL
PLAN AND PROFILE

MOREY'S LANDING
STORMWATER OUTFALL
OREGON



DESIGNED BY: [Signature]
DRAWN BY: [Signature]
CHECKED BY: [Signature]
DATE: 11/14/13

2927
1427
C100

Morey's Landing

Late August / early
September 2013 –
initial construction of
lower rock ramp



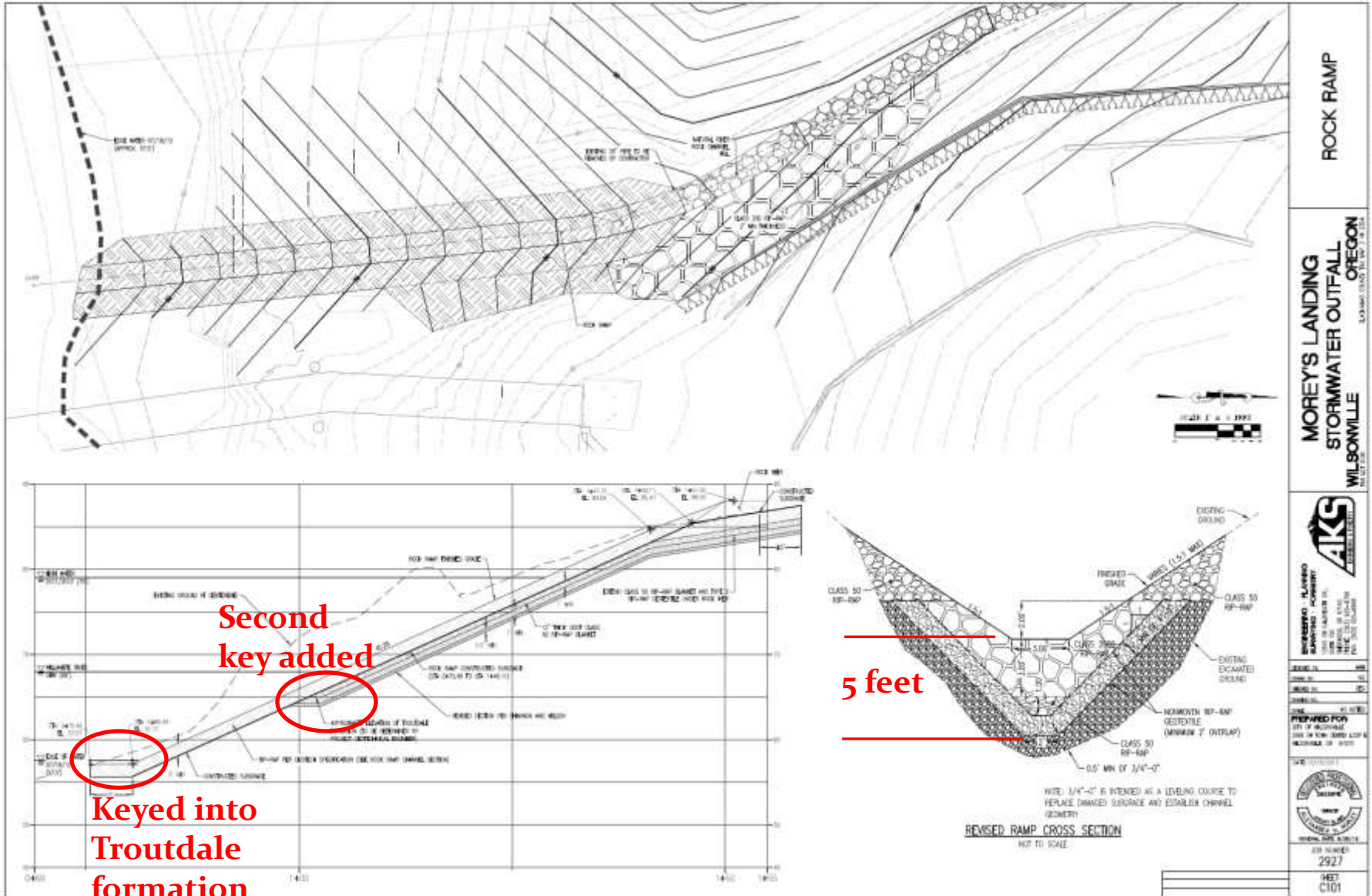
Morey's Landing

Effects of a monsoonal rain event
 $\pm 5''$ over 3 days, September 2013
and a change in repair plans



Morey's Landing

Revised Project Design



Morey's Landing

Starting over, building it better



Morey's Landing

Manhole is in original
location of east side outfall



Transition from
rock ramp to
step pools



Morey's Landing

Project completion
December 2013



Morey's Landing

October 2015



Shannon & Wilson is
under a 3-yr contract to
monitor the outfalls and
storm channels

Rivergreen

Where we started, 2005:



First design, September 2009
shift outfall 350 ft east via a swale
to existing small drainage way:



Rivergreen



Basin size:

12.5 acres



Rivergreen

Work completed in September 2009,
first signs of failure in October 2009,
below the constructed log steps



Lowest Log Step

Emergency
repairs -
sandbags



Rivergreen

Bank failure, March 2011
- a change in repair plans



±25 ft from top of
bank to river level



MSE stabilized
bank from
2009 repairs

Rivergreen

September 2011 –
First Step, Rebuild
the Swale



Rivergreen

2013 – Second step
Construct new, Lower
Outfall to Willamette



Lowest Log Step



Rivergreen

Lower Outfall
Project completion
November 2013

October 2015



Lessons Learned

- Extend bank improvements to late summer river level
- Stormwater release point at bottom of drainageways
- Understand poor soil conditions/geotechnical limitations
- Burrowing animals increase infiltration and groundwater elevation
- Install stormwater bypass system as early as possible
- Maintain project management continuity
- Ensure proper operation and maintenance of stormwater outfalls

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Questions?

