WATEREUSE ARIZONA

21st Century Water Reuse System Optimization Tool

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carollo
Engineers...Working Wonders With Water™

AZ Water ASSOCIATION
Professionals Dedicated To Arizona's Water

Why do utilities implement water reuse?

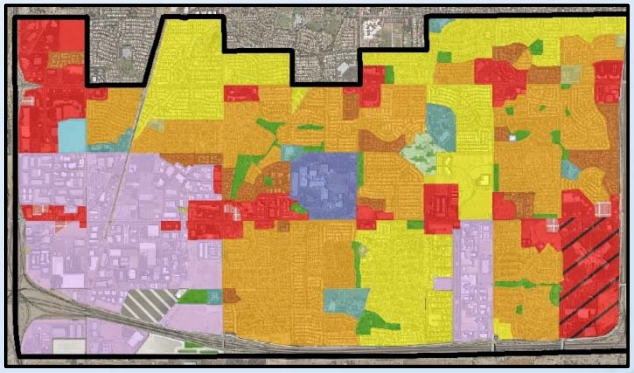
Water scarcity

Drought protection

Wastewater management

Water resources managers face complex decisions

Water resources managers face complex decisions



Blue Plan-it® creates virtual water resources futures

Water quantity

Water quality

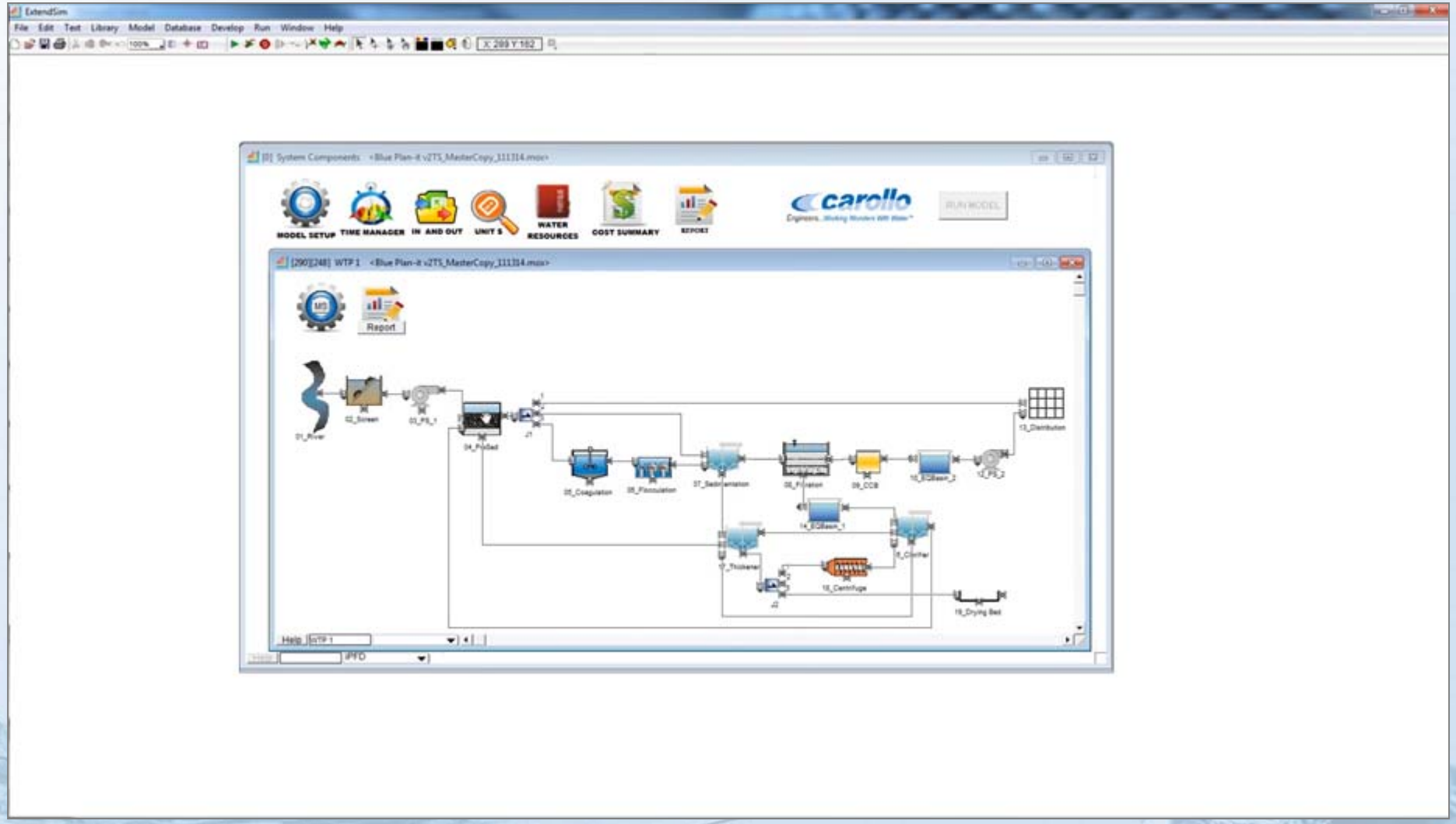
Mass balance

All water systems

Capital and O&M costs

Water resource use summary

Blue Plan-it® enables flexible planning



Water Reuse Case Studies

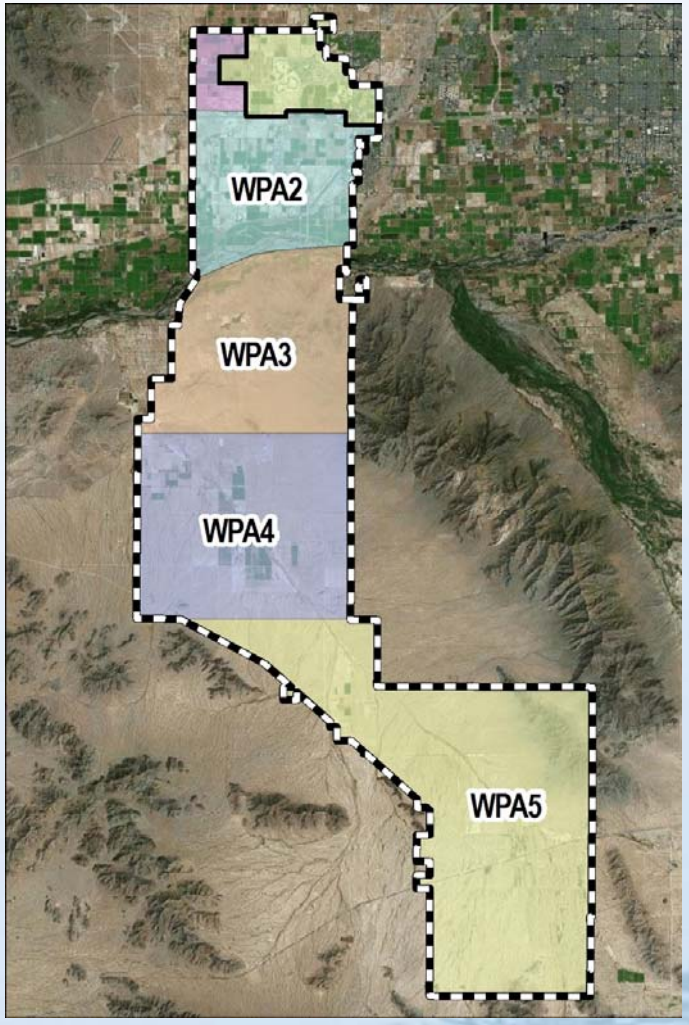
City of Goodyear, AZ

Middle Plains Community

The City of Goodyear, Arizona

- Phoenix Metro, West Valley City
- Phoenix AMA
- Population 74,000

The City of Goodyear, Arizona



City Limits: 191 mi^2

Planning Area: 250 mi^2

Water Resources

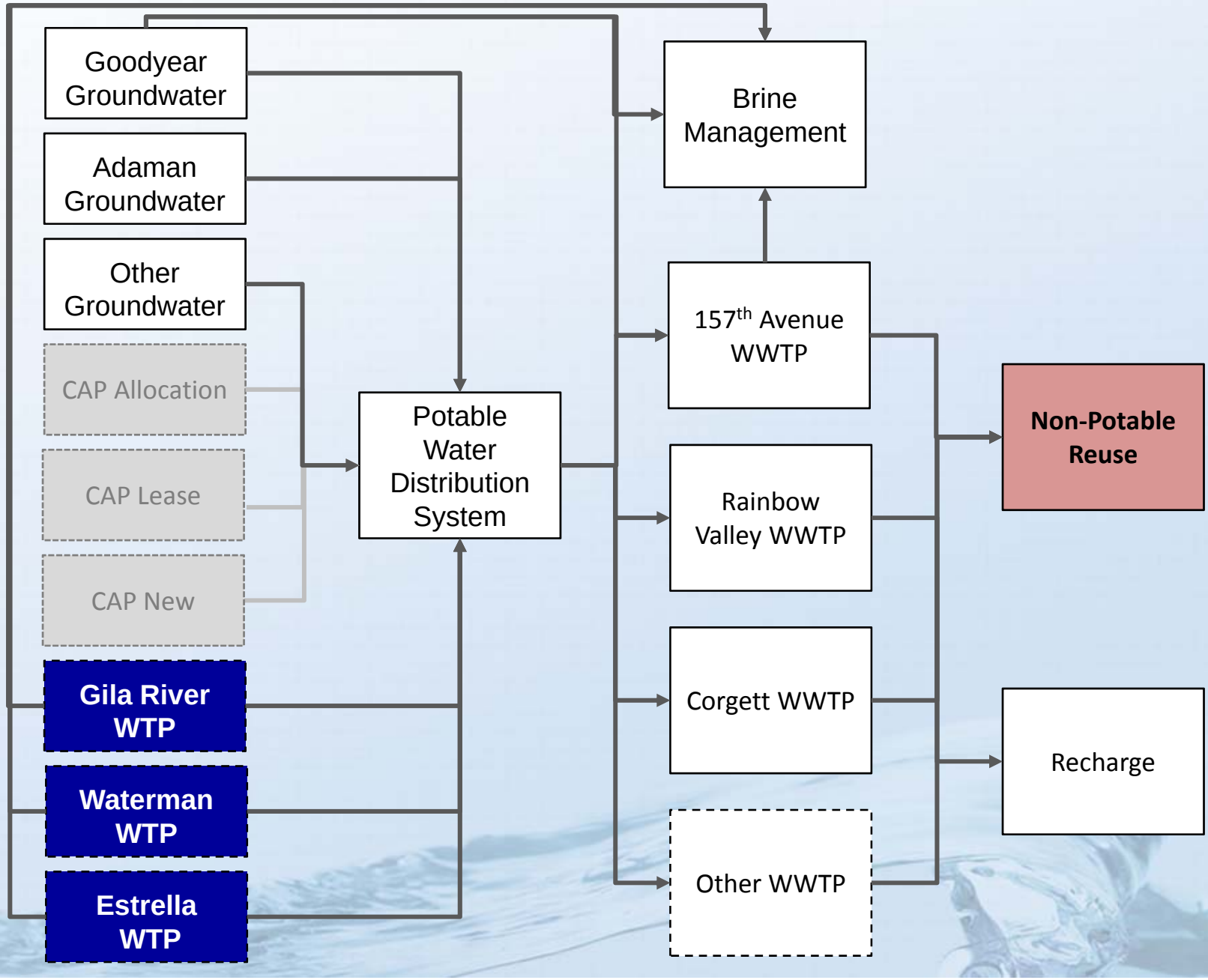
- Groundwater
- Reclaimed Water
- Central Arizona Project (CAP) Surface Water

Key decisions impact Goodyear's water resources future

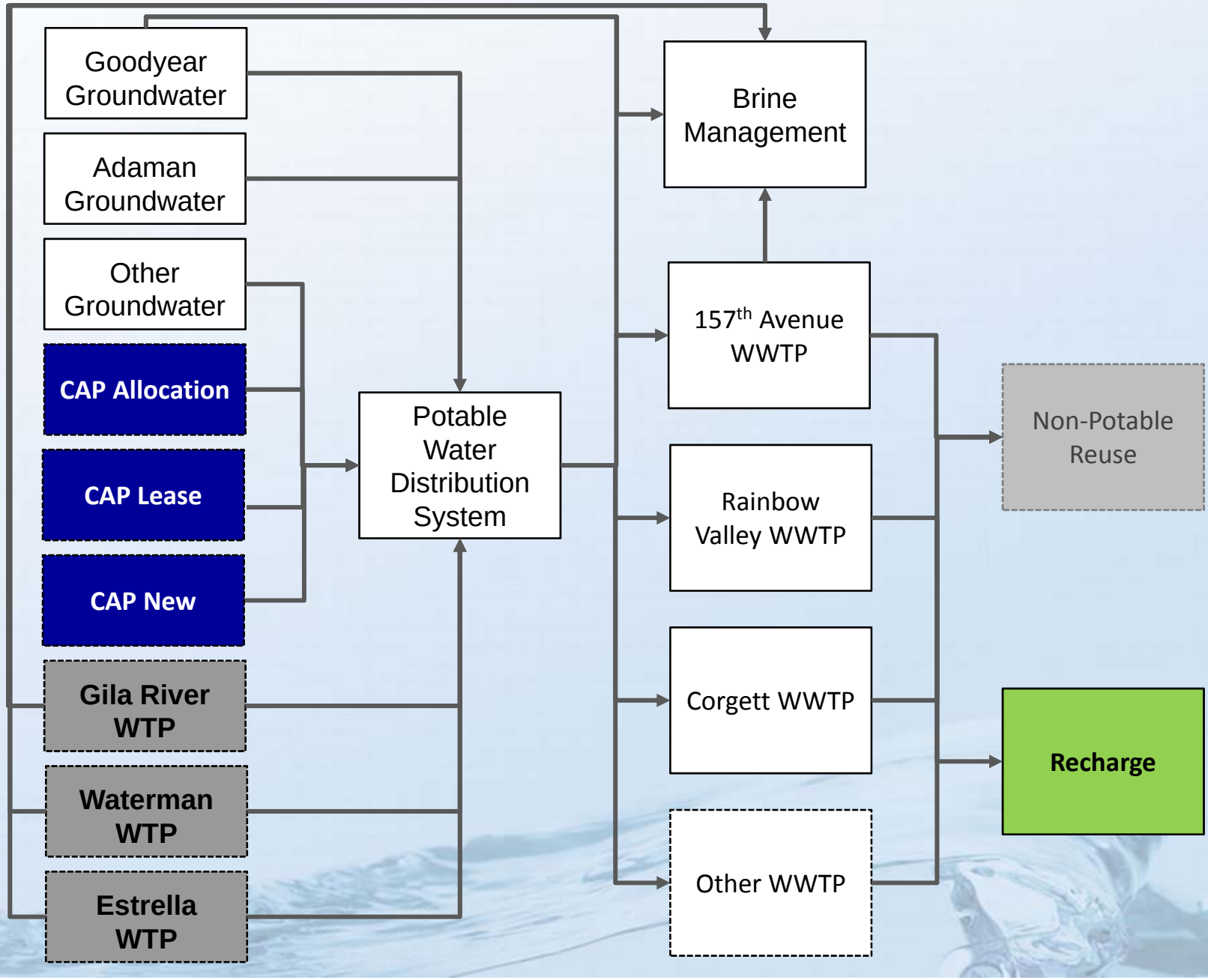
What is the "best" way to use reclaimed water?

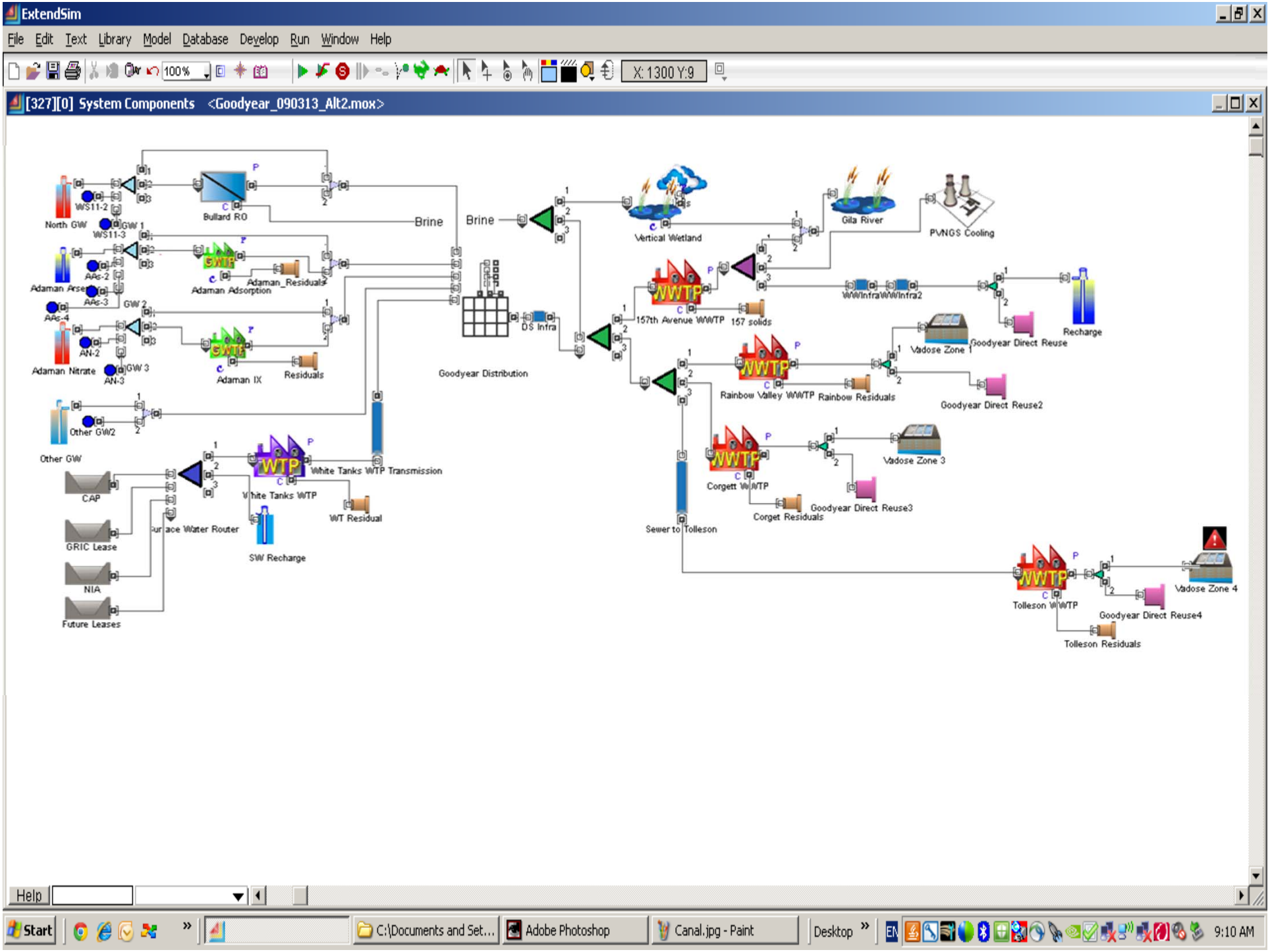
When is direct delivery of CAP water needed?

Alt 1: Develop groundwater and NPR

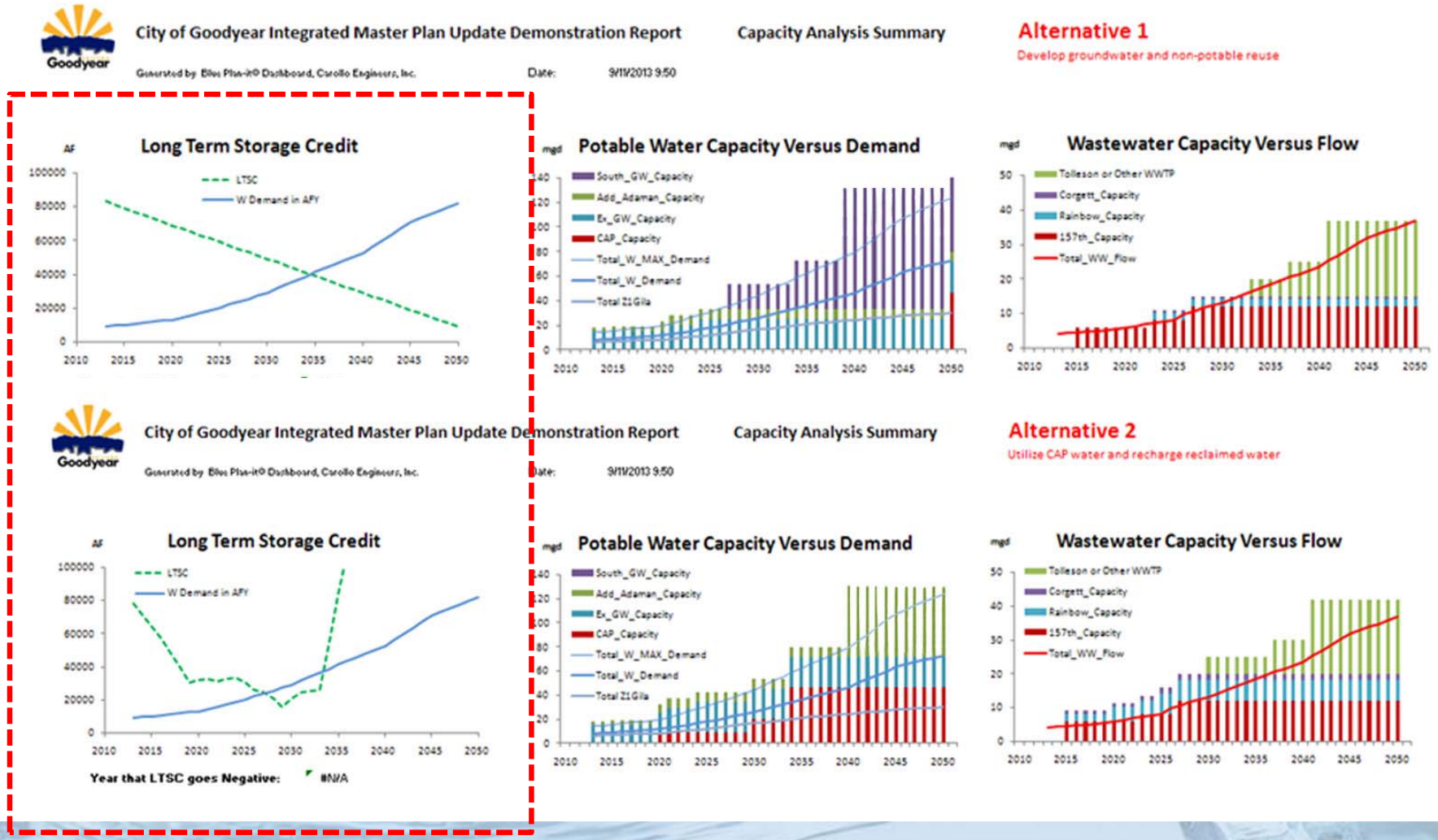


Alt 2: Prioritize CAP use and recharge

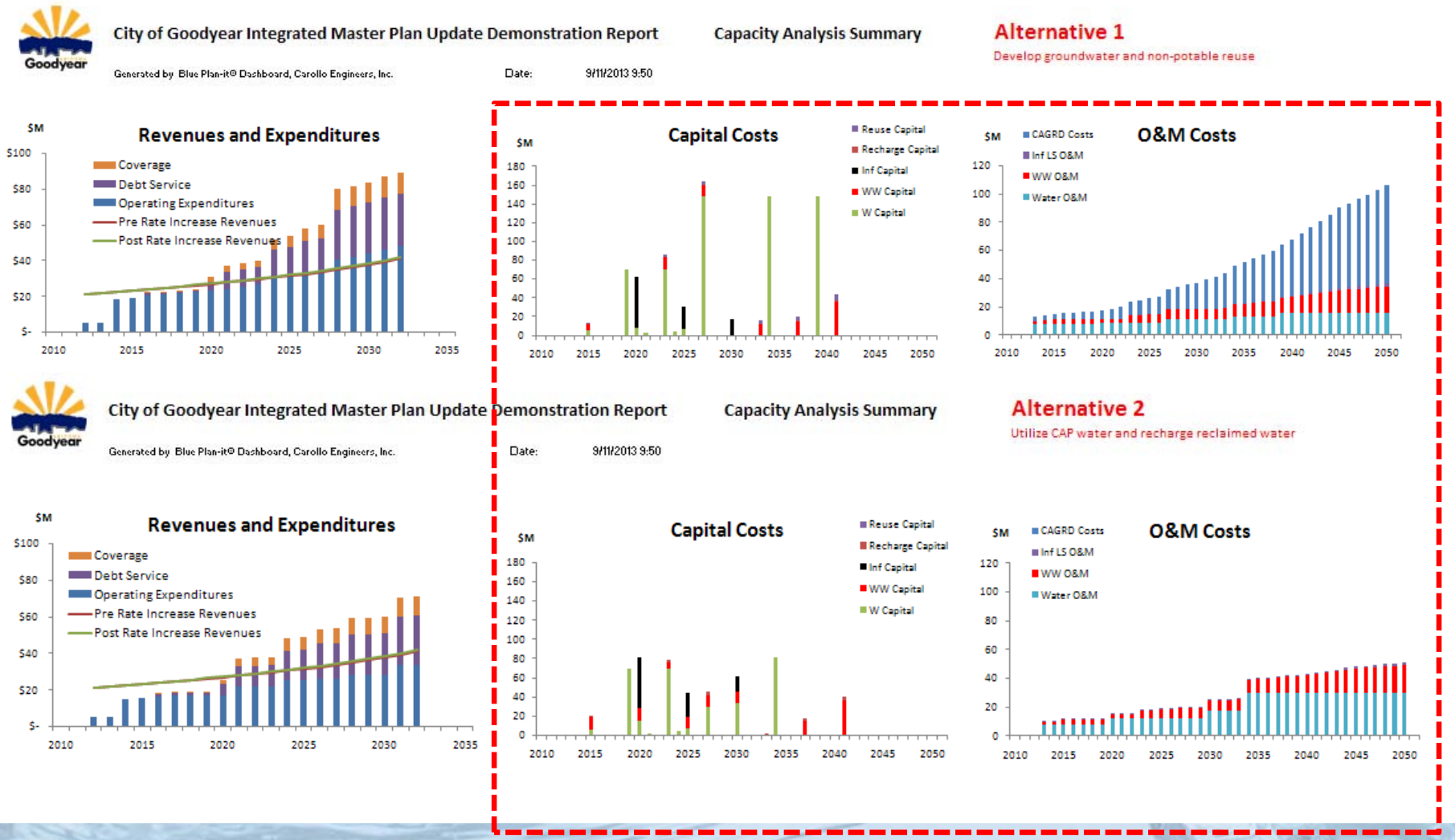



ExtendSim
File Edit Text Library Model Database Develop Run Window Help
100%
X: 1300 Y:9
[327][0] System Components <Goodyear_090313_Alt2.mox>
North GW
WS11-2
WS11-3
GW 1
Bullard RO
Brine
Brine
Vertical Wetland
Gila River
PVNGS Cooling
Adaman Arsenic
AAs-2
AAs-3
GW 2
AAs-4
GWTP
Adaman Adsorption
Adaman_Residuals
Adaman Nitrate
AN-2
AN-3
GW 3
GWTP
Adaman IX
Residuals
Goodyear Distribution
DS Infra
NWTP
157th Avenue WWTP
157 solids
WWInfra
WWInfra2
Recharge
Vadose Zone 1
Goodyear Direct Reuse
Rainbow Valley WWTP
Rainbow Residuals
Goodyear Direct Reuse2
Other GW2
Other GW
CAP
GRIC Lease
NIA
Future Leases
WTP
White Tanks WTP
White Tanks WTP Transmission
WT Residual
SW Recharge
Corgett WWTP
Corget Residuals
Vadose Zone 3
Goodyear Direct Reuse3
Sewer to Tolleson
Tolleson WWTP
Vadose Zone 4
Goodyear Direct Reuse4
Tolleson Residuals
Help
Start
C:\Documents and Set...
Adobe Photoshop
Canal.jpg - Paint
Desktop
9:10 AM

Long term storage credits comparison indicates Alternative 2 is more sustainable



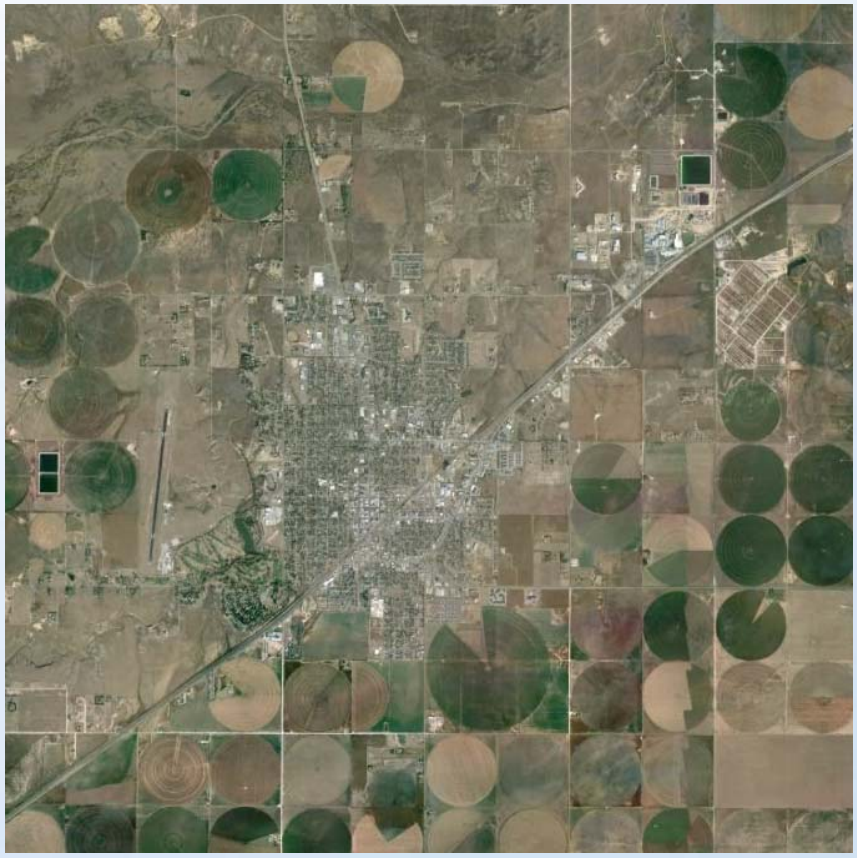
Cost comparison indicates Alternative 2 is also more economical



Goodyear case study take home points

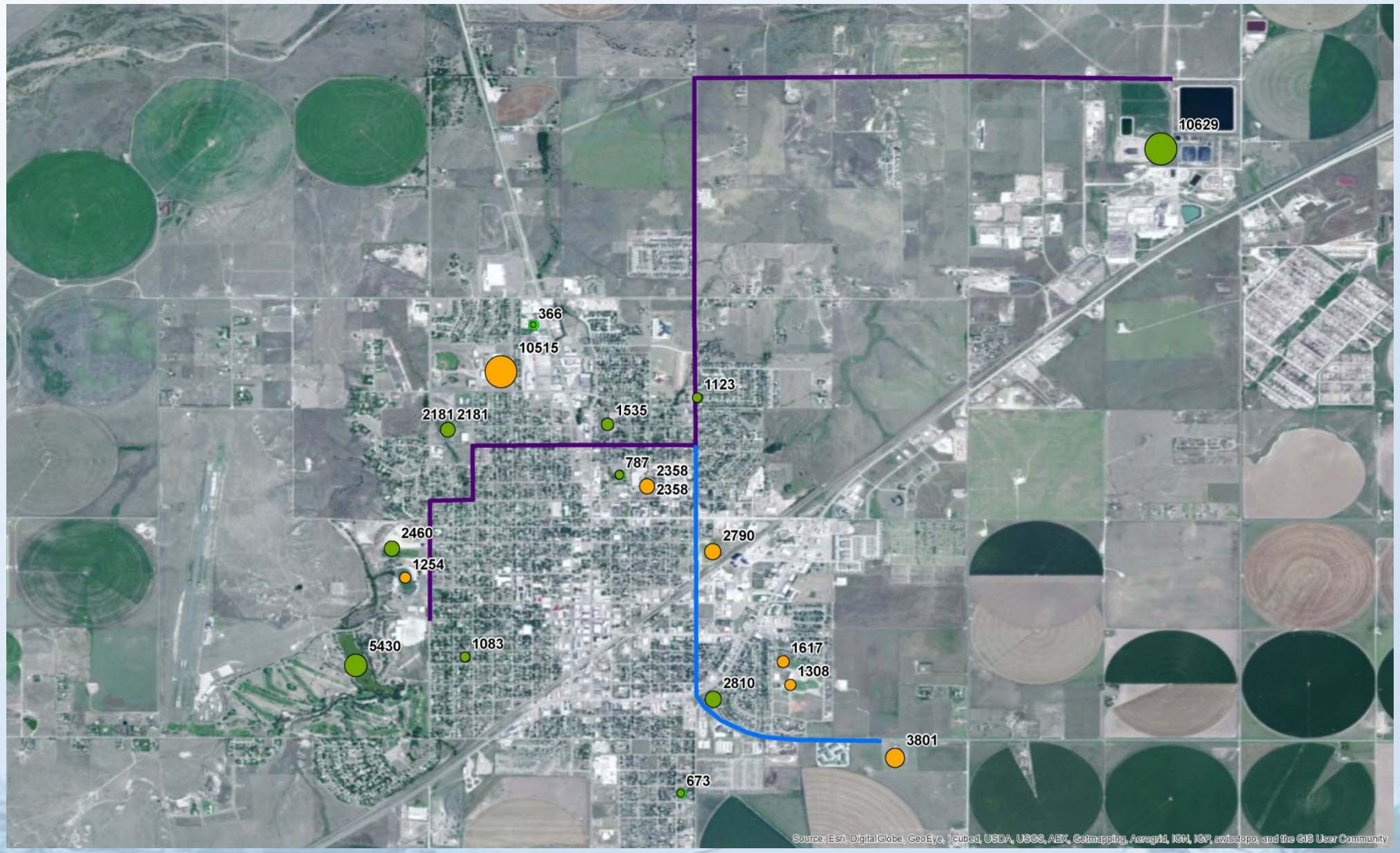
- Model shows benefits of IPR and surface water use
- Not a fully developed “master plan” solution
- Establishes a framework for more detailed alternative analysis

Middle Plains Community



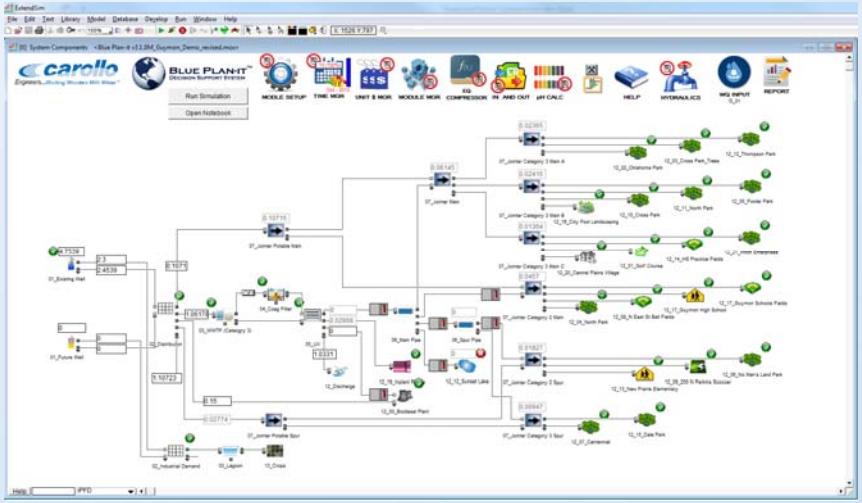
- Population < 20,000
- ~ 20 irrigation customers
- Reclaimed water currently disposed of through crop irrigation

Water quality drives potential reclaimed water customers



Water reuse feasibility study

- Extended period simulation
- Monthly demands for 20+ potential reclaimed water users in two water quality categories
- Dynamic CIP optimization for new wells, pipelines, and treatment plant expansion
- Cost summary and groundwater saving analysis

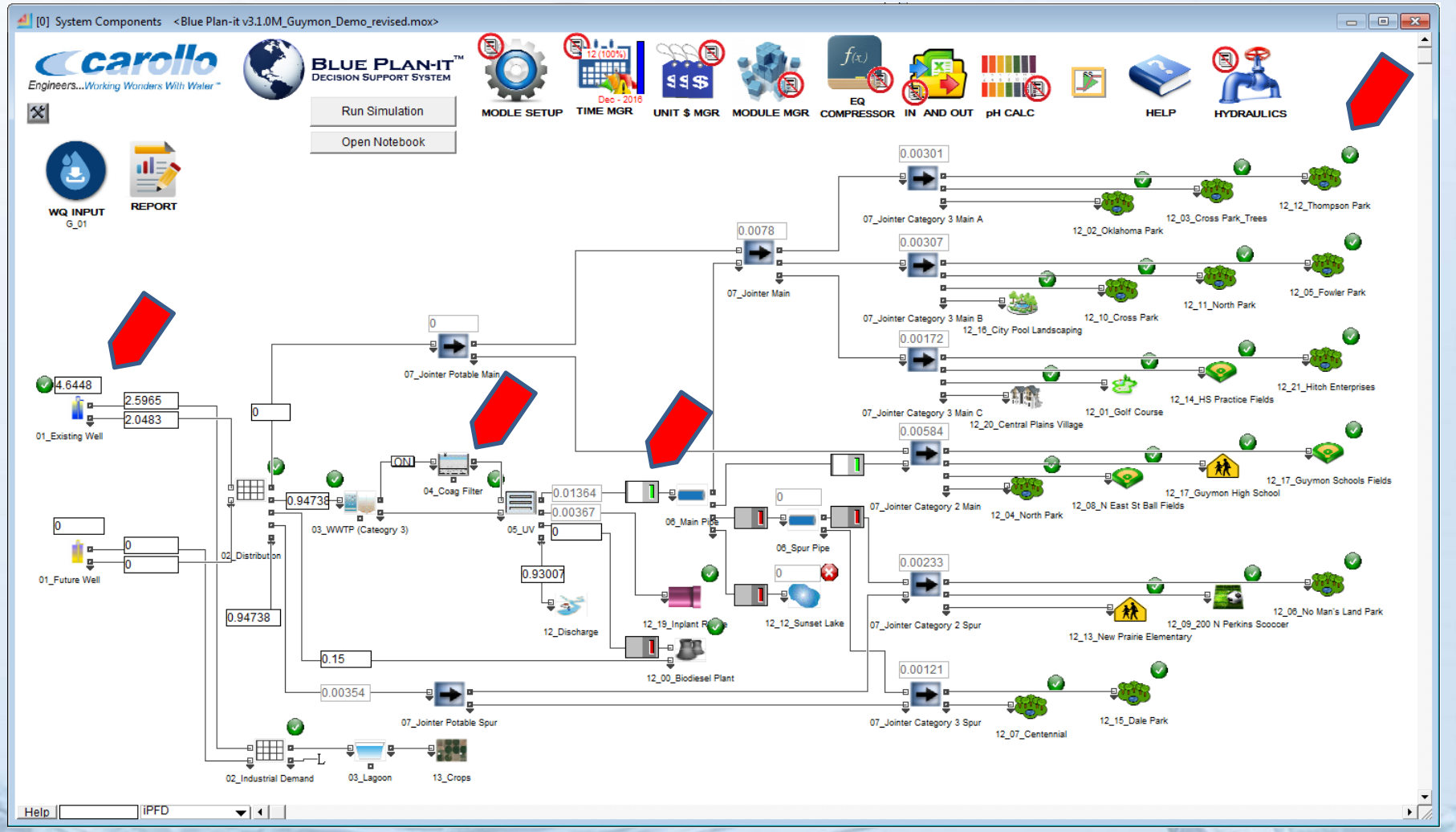


BLUE PLAN-IT™
DECISION SUPPORT SYSTEM

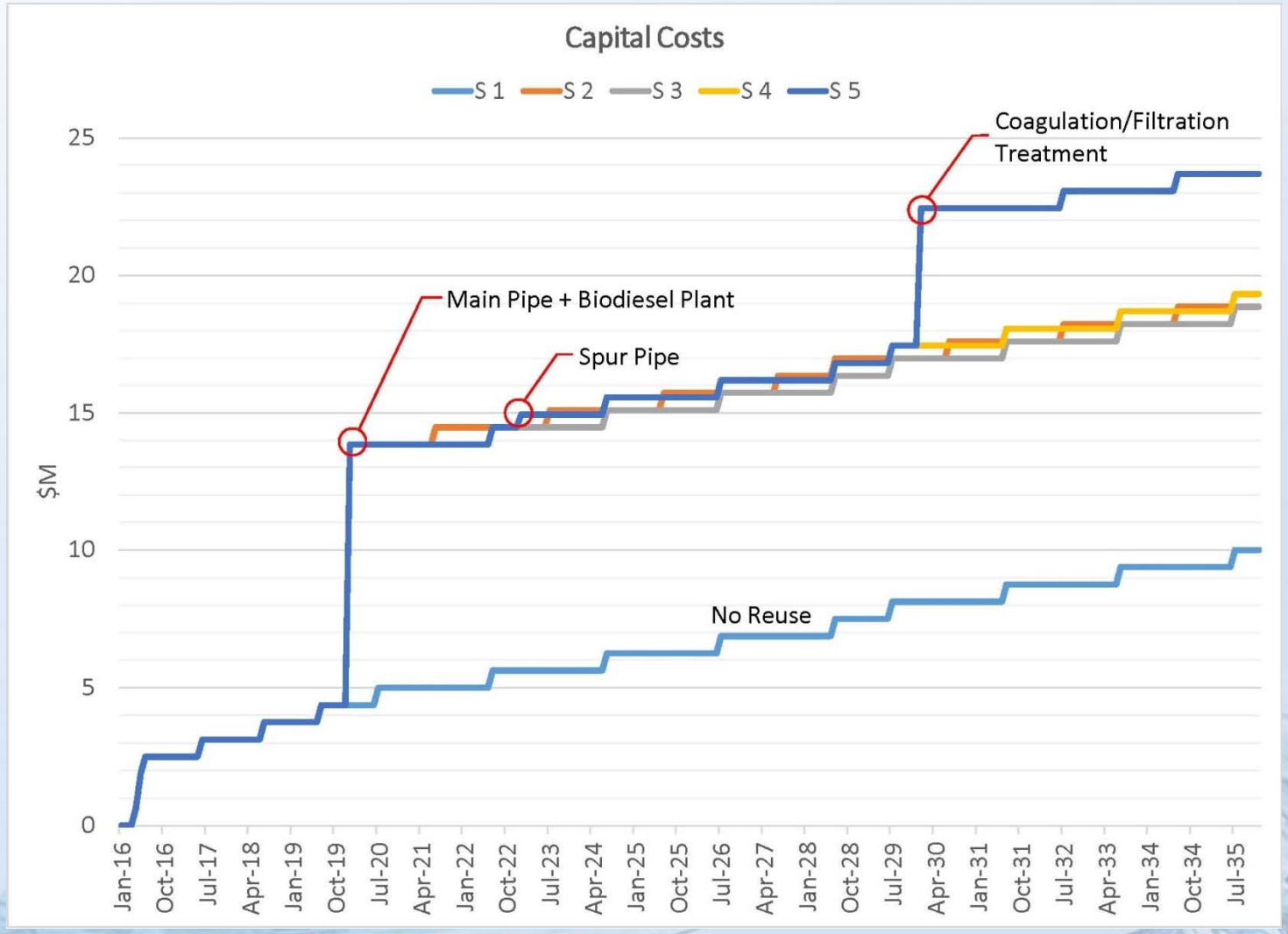
Scenarios compare supply options to potential customers

Scenario	Description
1	No reuse
2	Category 3 reuse only, main pipe
3	Category 3 reuse only, main pipe & biodiesel plant
4	Category 3 reuse only, main pipe & spur & biodiesel plant
5	Category 2 and 3 reuse, main pipe & spur & biodiesel plant

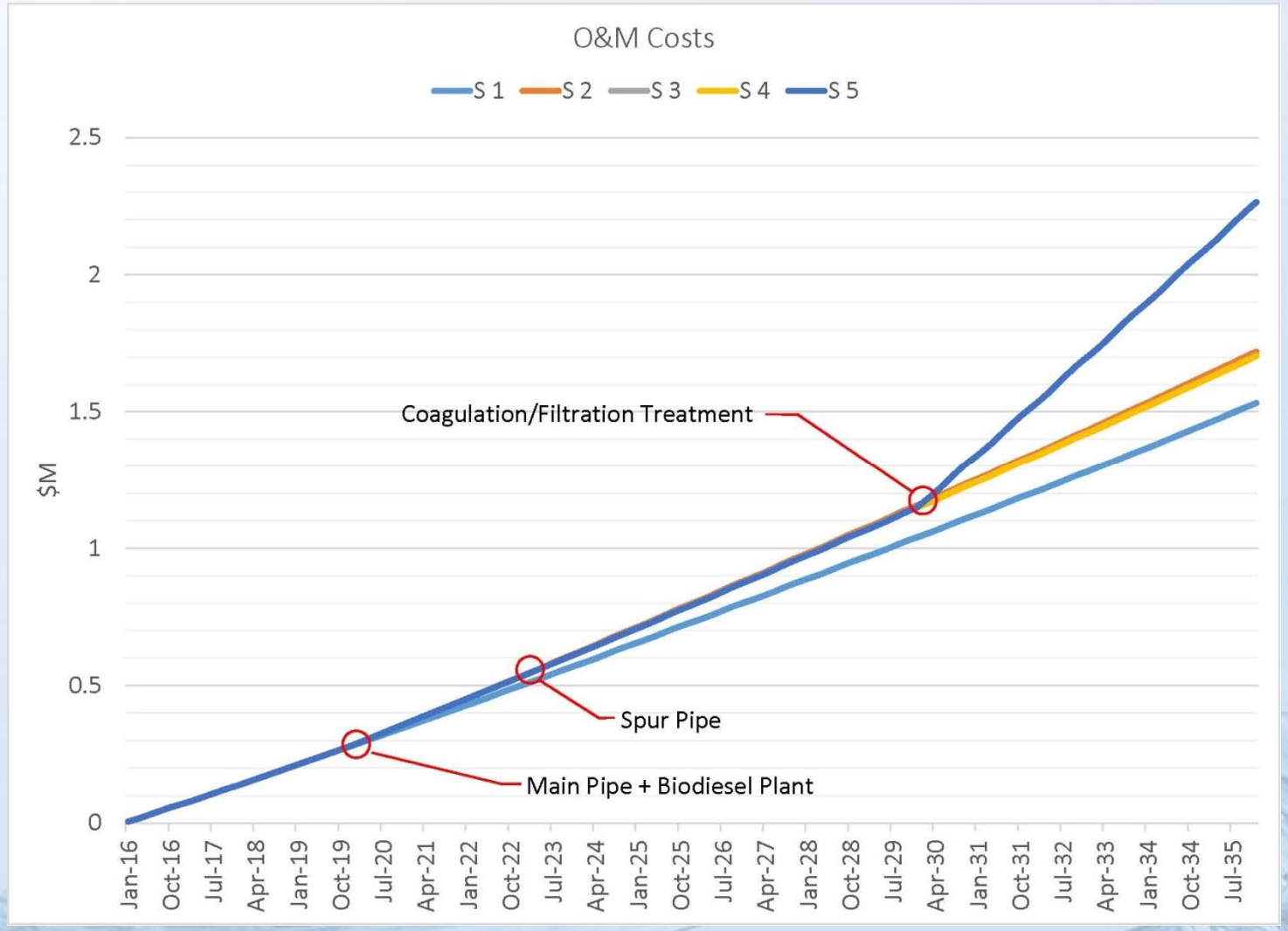
Scenarios compare supply options to potential customers



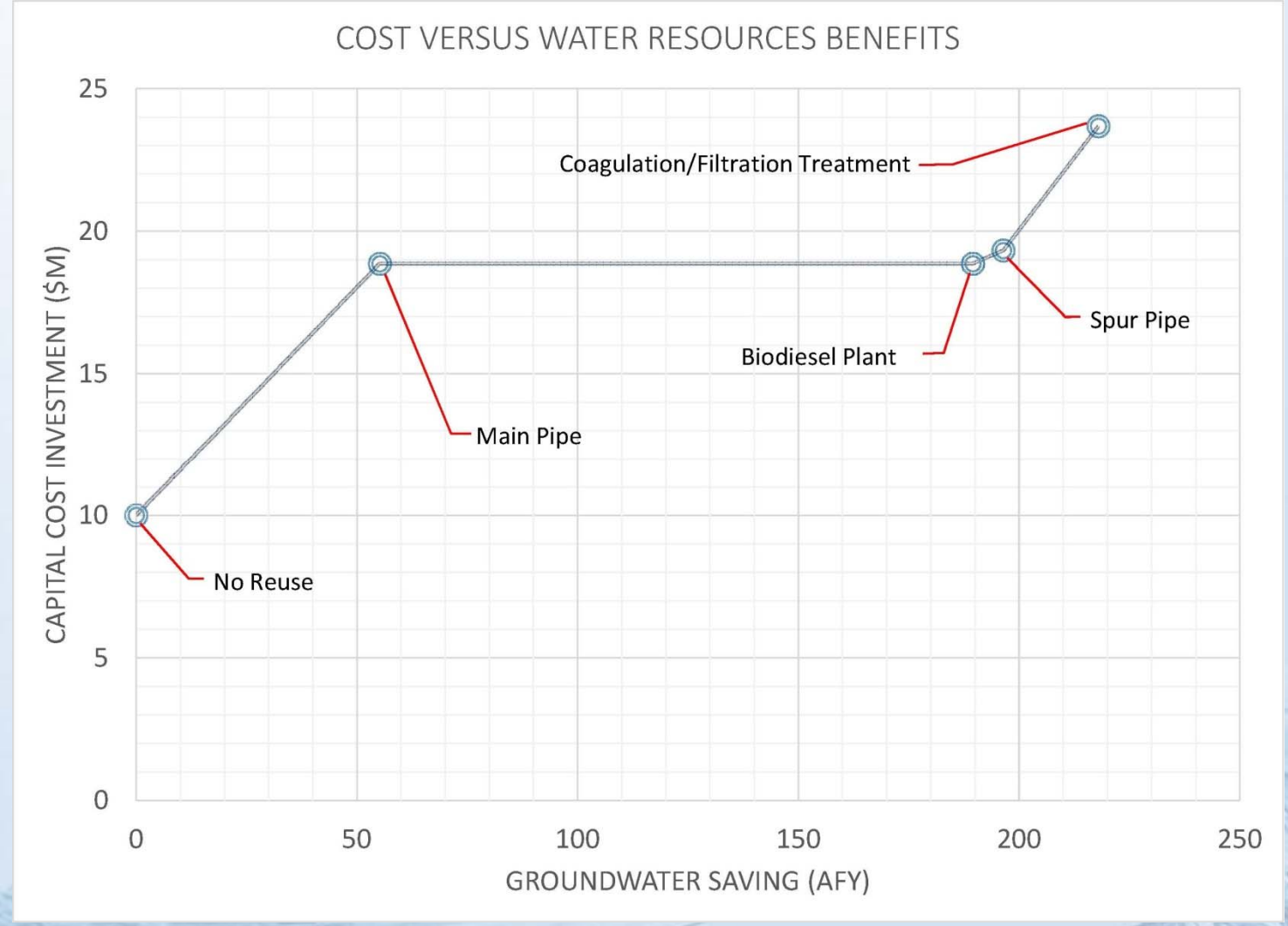
Capital cost summary shows impacts of expanding reuse



O&M cost summary shows impacts of expanding reuse



Cost comparison shows water resources benefits



Middle plains community case study take home points

- Model enables rapid scenario configuration and comparison
- Offset of potable demands via NPR is quantified
- Provides basis for cost/benefit analysis for expanding NPR

Blue Plan-it® enables a decision support environment

Arizona State University Decision Theatre

Blue Plan-it® enables collaborative decision making

Conference Room

Water Resources

Engineering

Operations

Finance

City Management

Economic Development

Blue Plan-it® enhances water reuse planning

- Creates a virtual road map for water resources deployment
- Compliments scenario planning approaches
- For the City of Goodyear, AZ, **Blue Plan-it®**
  - Demonstrated the benefits of developing surface water supplies and engaging in indirect potable reuse
  - Fostered communication between City departments in water resources decision making
- For the middle plains community, **Blue Plan-it®**
  - Enabled rapid scenario development and comparison
  - Incorporated wastewater treatment process alternatives in reuse planning scenarios

Questions?

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