• Introductions
• Stakeholder Feedback
• Friant Water Supply Briefing
• 2016 In Review
  – Restoration Flows; RWA; R&R
• 2017 Outlook
  – Restoration allocation; Delta Recapture; Part III offset
• RFG 2.0 Debrief
• WMG Project Updates
• Adjourn
AIRBORNE SNOW OBSERVATORY
ASO

• Aerial monitoring begun this winter
• Currently has inadequate funding
• USBR funding rejected, in line for possible mid-year funding
• Forecasting component through USDA-ARS on hold pending funding
• Concept supported by SCCAO and CVO
• Integration and Operational Use
  – DWR PRMS model (future B120s)
  – Independent forecast by USDA-ARS
  – Gradual integration with NWS River Forecast Center model
  – Other “home grown” models, use 4 years of previous data provided by Tuolumne (Hetch Hetchy)

• 3-Year integration plan

• Long-term funding support would be critical
  – Sierra Nevada Wide?
  – CA government support
ASO

- Jan 30 flight trace (take 2-4 days to cover watershed)
FRIANT WATER SUPPLY BRIEFING
2016 IN REVIEW
2016 Restoration Year Type

Final Forecast:
Normal-Dry year type
1,301 TAF
(September 30, 2016)
2016 Restoration Allocation

- Provisional Restoration Allocation 1/26/16:
  - 9,445 AF through February 29

- Full Restoration Allocations
  3/18/16: 261,400 AF  RA schedule 129,000
  4/14/16: 276,085 AF  RA schedule 144,224
  5/31/16: 266,932 AF  RA schedule 135,071
  7/7/16: 270,297 AF  RA schedule 131,861

- Final Restoration Allocation 9/30/2016:
  - 263,295 AF  RA schedule 109,586
2016 Restoration Year Actions

- First Restoration Flows in 2+ years
- Provisional Allocation due to South-of-Delta water supply shortfall
- Pulse flows to test juvenile salmon capture and transport
- K-Rat surveys, ESB Sand Removal, LSJLD control gates rehab, Mendota Dam maintenance, Red Top pipeline construction, Arroyo Canal maintenance
- Nearly half of allocation became URFs
- First flows below Sack Dam - Aug 17
- First recapture in lower SJR
# 2016 Tally – Allocation & Flows

## Allocation & Flows

<table>
<thead>
<tr>
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<th>TAF</th>
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<td>Unreleased Restoration Flows Distributed</td>
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<td><strong>Restoration Total</strong></td>
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## Buffer Flows

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## 2016 Tally – URFs Distributed

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<td>Multiple Parties</td>
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<td>Tier 1 ($60)</td>
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<td>Tier 2, Block 2 ($150)</td>
<td>19.999</td>
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<td>Tier 2, Block 3 ($150)</td>
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<td>Tier 2, Block 4 ($20)</td>
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<td></td>
<td>127.819</td>
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<td>Total URFs Distributed</td>
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## 2016 Tally – Recapture

### @ Mendota Pool

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<tbody>
<tr>
<td><strong>MP Recapture (MP Inflow minus Sack Dam Releases)</strong></td>
<td><strong>9.490 TAF</strong></td>
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</table>

### @ Lower San Joaquin River & Delta

<table>
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<tr>
<td>Actual Recapture @ PID</td>
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<td>Actual Recapture @ Delta</td>
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<tr>
<td><strong>Actual Lower SJR Recapture</strong></td>
<td><strong>0.803 TAF</strong></td>
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### Total Recapture to Date

| Value                          | 10.293 TAF |

#### POTENTIAL FUTURE RECAPTURE

**Mendota Pool**

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<tr>
<th>Month</th>
<th>Value</th>
<th>From:</th>
<th>To:</th>
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</thead>
<tbody>
<tr>
<td>November</td>
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<td>11/29/2016</td>
<td>11/30/2016</td>
</tr>
<tr>
<td>December</td>
<td>0.000 TAF</td>
<td>12/1/2016</td>
<td>12/31/2016</td>
</tr>
<tr>
<td>January</td>
<td>0.000 TAF</td>
<td>1/1/2017</td>
<td>1/31/2017</td>
</tr>
<tr>
<td>February</td>
<td>0.000 TAF</td>
<td>2/1/2017</td>
<td>2/28/2017</td>
</tr>
<tr>
<td><strong>MP Recapture</strong></td>
<td><strong>0.000 TAF</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Lower San Joaquin River**

<table>
<thead>
<tr>
<th>Month</th>
<th>Value</th>
<th>From:</th>
<th>To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>November</td>
<td>0.000 TAF</td>
<td>11/29/2016</td>
<td>11/30/2016</td>
</tr>
<tr>
<td>December</td>
<td>0.000 TAF</td>
<td>12/1/2016</td>
<td>12/31/2016</td>
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<tr>
<td>January</td>
<td>0.000 TAF</td>
<td>1/1/2017</td>
<td>1/31/2017</td>
</tr>
<tr>
<td>February</td>
<td>0.000 TAF</td>
<td>2/1/2017</td>
<td>2/28/2017</td>
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<tr>
<td><strong>Lower SJR Recapture</strong></td>
<td><strong>0.000 TAF</strong></td>
<td></td>
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</tbody>
</table>

**Total Potential Future Recapture** | **0.000 TAF** |

**Grand Total 2016 Restoration Year Recapture** | **10.293 TAF**

*Lower SJR Recapture updated to 0.833 TAF*
RWA True Up

• RWA workshop in August 2016
• SJRRP updated and distributed the RWA balances for Contractor review
• Updates and clarifications to RWA impact model methodology have been identified
• QA/QC of RWA balances is ongoing
## RWA Balances

### San Joaquin River Restoration Program

**Recovered Water Account Remaining Credits by Contractor - August 2, 2016**

<table>
<thead>
<tr>
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<td>12</td>
<td>9,466</td>
<td>6,838</td>
<td>16,835</td>
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<td>9,418</td>
<td>4,739</td>
<td>7,590</td>
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<td>City of Lodi</td>
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<td>6,571</td>
<td>4,348</td>
<td>3,148</td>
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<td>City of Madera</td>
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<td>County of Sutter</td>
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<td>Delano, CA</td>
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<td>1,221</td>
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**Credits Transfers**

- **Credit Transfers**
- **Credits Remaining**
- **Recirculation**
- **2014 URF Water**
- **RWA $10 Water**

**Note:**
- Preliminary Draft, Subject to Revision
- Data subject to revision.
## Friant-Wide Impacts & Offsets (AF)

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<th>2010</th>
<th>2011</th>
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Preliminary Draft, Subject to Revision
# Stored 2013 Restoration Flows

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<th>Amount Remaining</th>
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<tr>
<td>CCID</td>
<td>2,860</td>
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<td>James ID</td>
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<td><strong>Total</strong></td>
<td><strong>3,628 AF</strong></td>
<td><strong>2,753 AF</strong></td>
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* Allocated pro rata to Class 1 contractors
Recaptured 2016 Flows

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<thead>
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<th>Mendota Pool</th>
<th>PID/BCID</th>
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<tbody>
<tr>
<td>July</td>
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<td>August</td>
<td>3,019</td>
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<td>September</td>
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<td>October</td>
<td>1,616</td>
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<tr>
<td>November</td>
<td>843</td>
<td>833</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>9,490</strong>*</td>
<td><strong>833</strong></td>
</tr>
</tbody>
</table>

* Allocated pro rata to Class 1 contractors
** Allocated to participating Class 1 contractors
What we learned in 2016

• In river coordination is essential; progress on improving relationships
• Frequent collaboration with SCCAO benefits the Program
• Some unresolved sections of Restoration Flow Guidelines; parties willing to address
• Come a long way, but still a lot to learn

• Input from Stakeholders?
2017 Restoration Year Type

Jan 20 Allocation:
Wet restoration year type
3,134 TAF
(20/80 blend of DWR/NWS)

2017: 673.4 TAF / 556.5 TAF
2017 Restoration Year

• January 20 Initial RF Allocation
  – Wet restoration year type
  – 673 TAF Friant Dam release / 557 TAF @ GRF

• January 31 RA Recommendation
  – 300 cfs limit below Sack Dam in Spring & Summer
  – Changeover to RFs at end of flood flows
  – 197 TAF scheduled / 359 TAF Unreleased Restoration Flows (URFs)
2017 URF Outlook

• 359 TAF Expected with Current RA Flow Schedule
  – Program needs to Allocate URFs quickly to avoid being lost to spill
  – Recipients need to delivery URFs prior to the end of Uncontrolled Season, if not, Water Supply Test will be applied to determine if URFs are still available for delivery
  – All sales in 2017 / no Exchanges
2017 URF Outlook

• Tier 1 ($20 – no refunds)
  – Block 1 of 237,500 AF
  – Offered to Class 2 contractors first
  – Early delivery option, but must schedule after all of a contractors 2016 URF supply
  – Subsequent blocks likely

• Tier 2 (Variable Price ~ $35)
  – Only utilized if Millerton Reservoir is under control
  – Fully schedulable / no risk of spill
  – Price = (275,000 / Runoff in TAF) - 40
How URFs Spill

• 2017 URFs can be delivered throughout UcS
• At end of UcS:
  URF deliveries + RF @ GRF ≥ Exhibit B hydrograph
  – If not, difference subtracted from undelivered URF volume
  – URFs that have not been allocated (i.e. still held by RA) would likewise be reduced

<table>
<thead>
<tr>
<th>Date</th>
<th>Default Hydrograph at GRF</th>
<th>2017 RA Schedule at GRF</th>
<th>Volume of URFs that would need to be delivered to avoid spill if UcS ends (GROSS)</th>
<th>Volume of URFs that would need to be delivered to avoid spill if UcS ends (NET)</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>March 16</td>
<td>11.1</td>
<td>12.2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>April 1</td>
<td>54.5</td>
<td>25.2</td>
<td>29.3</td>
<td>27.8</td>
</tr>
<tr>
<td>April 16</td>
<td>124.4</td>
<td>37.4</td>
<td>87.0</td>
<td>82.7</td>
</tr>
<tr>
<td>May 1</td>
<td>238.9</td>
<td>49.6</td>
<td>189.3</td>
<td>179.8</td>
</tr>
<tr>
<td>May 16</td>
<td>292.8</td>
<td>61.8</td>
<td>231.0</td>
<td>219.5</td>
</tr>
<tr>
<td>June 1</td>
<td>350.2</td>
<td>74.8</td>
<td>275.4</td>
<td>261.6</td>
</tr>
<tr>
<td>June 16</td>
<td>404.1</td>
<td>87.0</td>
<td>317.1</td>
<td>301.2</td>
</tr>
<tr>
<td>July 1</td>
<td>457.9</td>
<td>99.2</td>
<td>358.7</td>
<td>340.8</td>
</tr>
</tbody>
</table>
Pilot Recapture at Delta Facilities

- First year Restoration Flows to reach the Delta
- Challenges:
  - Tracking Restoration Flows
  - Consistency with Coordinated Operations Agreement
  - Delta Operational Constraints
- SJRRP and CVO will meet regularly to communicate Restoration Flows and Delta controlling factors to determine amount recaptured
## Factors Affecting Delta Recapture

<table>
<thead>
<tr>
<th>Condition</th>
<th>Factors</th>
<th>Notes</th>
<th>SJRRP Recapture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility constraints</td>
<td>Export pumps, San Luis storage, or canal conveyance capacity; maintenance outages</td>
<td>Restoration Flows junior to project water and transfers to CVP SOD</td>
<td>None</td>
</tr>
<tr>
<td>Delta Salinity</td>
<td>Managed by reducing exports</td>
<td>Additional inflow not much help</td>
<td>None</td>
</tr>
<tr>
<td>Delta Outflow</td>
<td>Net Delta Outflow Index (NDOI)</td>
<td></td>
<td>Recapture opportunity consistent with incremental improvement in NDOI</td>
</tr>
<tr>
<td>Delta E/I</td>
<td>D-1641; Export linked to Delta inflow and reservoir storage withdrawal</td>
<td>Consider Restoration Flows as a reservoir storage withdrawal</td>
<td>Recapture percentage consistent with D-1641 (if export capacity available)</td>
</tr>
<tr>
<td>OMR</td>
<td>NMFS BiOp RPA; determined by gage readings, but may move to an OMR index</td>
<td>Typically controls under COA excess conditions SJRRP inflows would improve OMR</td>
<td>recapture consistent with incremental improvement, as calculated by OMR Index</td>
</tr>
<tr>
<td>ESA take</td>
<td>BiOp RPA; exports may be constrained by take limits</td>
<td>Concern export of SJRRP water could affect take</td>
<td>Credit SJRRP to the extent that Restoration Flows can be diverted within constraints</td>
</tr>
</tbody>
</table>
## Delta Factors (cont.)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Factors</th>
<th>Notes</th>
<th>SJRRP Recapture</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-1641: Vernalis base flow and salinity objectives</td>
<td>New Melones releases made as necessary to meet objective</td>
<td>Restoration Flows improve New Melones operations when Vernalis flow objective is controlling; Restoration Flows not obligated to meet Vernalis standards, per SJR water rights. May change with future SWRCB decisions.</td>
<td>Delta recapture subject to compliance with objectives of D-1641 currently required of Reclamation and DWR</td>
</tr>
<tr>
<td>SJR I/E</td>
<td>NMFS BiOp; exports linked to flow at Vernalis for 60 days in April and May based on the San Joaquin Valley Classification (60-20-20 Index)</td>
<td>Potential to export transfers from the SJR basin when this controls; Restoration Flows junior to transfers to CVP SOD; pursuant to the SJRRS Act</td>
<td>Recapture percentage consistent with NMFS BiOp (if export capacity available)</td>
</tr>
</tbody>
</table>
RFG 2.0 Debrief

✓ Kickoff Meeting Aug 23 recommended topics for revision and prioritized tasks
✓ Small Workgroup met and drafted specific revisions
• Version 2.0 will be approved in February 2017
• Remaining revision topics planned for 2017 and 2018
RFG 2.0: New Exceedance Forecast

<table>
<thead>
<tr>
<th>If the 50% forecast is¹:</th>
<th>Value (TAF)</th>
<th>Date of Allocation Issuance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>January</td>
<td>February</td>
</tr>
<tr>
<td>Above 2200</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>1100 to 2200</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>900 to 1099</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>700 to 899</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>500 to 699</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>Below 500</td>
<td>90</td>
<td>90</td>
</tr>
</tbody>
</table>

- Earlier certainty of supply in Wet years, thus earlier release and less flood impacts
- Water provided to the RA when it is most useful
- Avoids forcing a shift of water from Spring to Summer because allocation was too conservative
- Extensive modeling using DWR and NWS forecast history
RFG 2.0 Revisions – Dry

Old Forecast Progression

New Forecast Progression

Mod 1 - Dry - Residual Progression

Mod 8 - Dry - Residual Progression

Preliminary Draft, Subject to Revision
RFG 2.0 Revisions – Normal-Wet

Old Forecast Progression

New Forecast Progression

Mod 1 - Normal-Wet - Residual Progression

Mod 8 - Normal-Wet - Residual Progression
RFG 2.0 Revisions - Wet

Old Forecast Progression

New Forecast Progression
• Joint decisions on blending DWR and NWS forecasts
  – Same logic applied to Friant Water Supply as Restoration Allocation
  – SJRRP Exceedance Forecast Progression set by RFGs
  – SCCAO can choose a different Exceedance Forecast (e.g. 75% vs 50% vs 90%)

• SCCAO and SJRRRP have been meeting weekly to go over data in detail and set the blending (e.g. 20%/80%)
RFG 2.0: Operational Adjustments

- Increased or decreased allocations may be scheduled accordingly
  - This does not constitute a flow shift that requires a Water Supply Test
- Flexibility for RA to make daily adjustments without full recommendation
- Final Allocation now made June 30
  - Greater certainty for Friant contractors (supply, URFs)
  - Water after July 1 is of lower value for Restoration Goal
  - Deviation from WY total will be tracked
- Clarity and clean up of Allocation/Recommendation Process
• Basic Water Supply Test logic
  – Proposed RA schedule compared to default schedule
  – Increase or advance of flood releases or advance of dead pool would constitute impact
  – Would be applied to shifts within Summer and Winter flow periods
  – Would be applied to shifting water out of Spring and Fall periods beyond the 4 week flexibility already provided for in the Settlement; or shifting water into the Spring and Fall period.

• Sections 6.3 and 6.4 are provisional – expire February 28, 2018
RFG Issues for 2017

• Recovered Water Account (Appendix H)
  – Adjust impact calculation to include URFs
  – Clarify offsets
  – 16(b) water distribution and management

• Forecasting Best Practices (Appendix I)

• Flexible Flow Provisions
  – Moving flows within and between seasons (transfers within the hydrograph)
  – Test for non-impact to Friant water supply

• URFs

• Monitoring
WATER MANAGEMENT GOAL
PROJECTS
Long Term R&R EIS

• Project Description Technical Memorandum
  – Summarizes the alternative formulation process
  – Documents the alternatives evaluation methods and results
  – Describes the alternatives to be evaluated in the LTRRRF EIS, including the No Action Alternative
  – Serve as the basis for the project description that will appear in the LTRRRF EIS

• TM Available to the Public in March 2017
Friant-Kern Canal Projects

FKC Reverse Flow Pump-Back
• $3.3M Financial Assistance Agreement awarded to FWA in August 2016
• RFQ Status

FKC Capacity Restoration
• Starting work with Friant Contractors to determine next steps
Madera Canal Projects

Madera Canal Capacity Restoration
• Feasibility Report and NEPA analysis
  – Settling Party draft - Spring 2017
  – Public Draft EA – Summer 2017

Low Flow Valve
• Contractor has submitted the Design for the new Valve. Minor concession made on the design specifications but will not affect flow in the Canal overall.
• Construction slated to begin Early to Mid summer 2017 following the completion of the Hatchery Water Supply project. Same contractor.
Agriculture Recharge Project

- U.C. Davis has acquired and installed the necessary monitoring equipment.
- Study is underway
Groundwater Financial Assistance

**Tulare ID - Cordeniz Basin**
- 80-acre basin
- Groundbreaking: December 2015
- Complete: Summer 2017

**Shafter-Wasco ID - Madera Avenue Intertie**
- 270-acre recharge basin at Kimberlina Rd.
- Environmental work completed and funding awarded
- Three basins are currently constructed and flood water turned out into them
Pixley ID - Joint Groundwater Bank
• 560-acre bank; 4.5 mile pipeline to new FKC turnout
• Financial Assistance approved; Revised Draft EA - early 2017

Porterville ID - In-Lieu Project
• Area 1: 1,450 acres connected to Wood-Central Ditch
• Area 2: 720 acres connected to FKC
• Financial Assistance awarded, Enviro. Complete
• Construction anticipated to start February/March
Part III Workshop – May 17

- Future FOA
- Calculating RWA offsets
Questions?
NEXT MEETINGS
## Next Meetings

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 21, 2017</td>
<td>Visalia</td>
</tr>
<tr>
<td>May 17/18 – Part III Workshop</td>
<td>Fresno/Visalia</td>
</tr>
<tr>
<td>September 15, 2017</td>
<td>Sacramento</td>
</tr>
</tbody>
</table>

Preliminary Draft, Subject to Revision