

Mercury Switch Removal – National Efforts



Presentation
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at the
Western States Project
Conference
Tucson, AZ
October 26, 2006

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Introduction

- Background
- National Switch Recovery Program
- Colorado's Program
- Recommendations
- Conclusion

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What is Mercury?

- Naturally occurring element
 - Hg^0 , Hg^{2+} , Hg^P
- Switches Use Hg^0
 - Physical
 - Colorless, odorless, liquid at room temperature
 - Chemical
 - Dense, vaporizes at room temperature

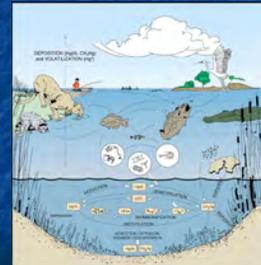


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What are the Effects of Hg ?

- Bio-conversion to methylmercury
- Health
 - central nervous system
 - developing fetus and young
- Persistent Bioaccumulative Toxin



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How Much Hg is a Problem?

- As little as 1 g, or the amount found in a thermometer or switch can contaminate a 20-acre lake



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What are the Sources of Hg Pollution?

- General sources
 - Natural events
 - Man-made
- Specific sources
 - Toxic Release Inventory (TRI)
 - Other Reported
 - Unreported
- Cross-media impacts
 - Water Body Impairment
 - Air Deposition

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Fish Consumption Advisories



Source: http://epa.gov/waterscience/fish/advisories/slides2004-1_files/slide6.html, downloaded 9/16/06
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Hg In Automobiles

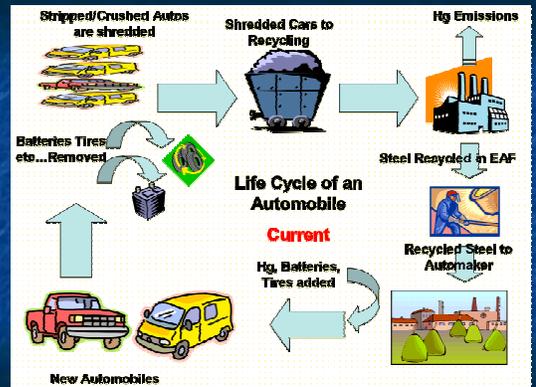
- Hg in automobiles
 - Convenience lighting
 - Anti-lock Braking Systems (ABS)
 - Active ride control system switches
 - High intensity discharge (HID) headlamps
 - Computer screens/monitors
 - Other

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Environmental Impacts

- Salvage entities
 - Dismantlers
 - Scrap handlers
 - Shredders
 - Brokers
- Steel mills

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Vehicle Convenience Lighting Switches



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Hg Emissions at Steel Mills



- Mills processes scrap metal
- Scrap metal includes automobiles that contain mercury switches
- Scrap metal is melted in furnaces
- Mercury emissions from furnaces are released to the air

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No Time to Waste

- Manufacturer's stopped using Hg-containing switches as of January 2003
- 10-15 year window of opportunity
- Easier to capture Hg before it is vaporized in steel mill furnaces

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Initiating Switch Removal Efforts

- Motivation
 - Mandatory v. voluntary
 - Desire to "do the right thing"
 - Peer pressure
- Ease
 - Michigan Mercury Switch Study
 - Removal Demonstration
- Regulatory impacts
 - Identify impacts
 - Universal Waste Rule
 - Possible new regulations
- Incentives
 - Offset costs
 - Provide training/guidance materials
 - Bounty

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Universal Waste Rule Requirements Summary

- Label as Universal Waste
- Record collection start date per batch
- Recycle off-site w/in 1 year of collection start date
- Train employees

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Addressing Hg Pollution: National Approach

- Cross-media regulation
 - Municipal Waste Combustors
 - Hospital Medical Infectious Waste Incinerators
 - Chlor-alkali Plants
 - Coal-fired Power Plants
 - Iron and Steel Foundries
 - Others (i.e. EAF Rule)
- Development of TMDLs
- Enforcement of Stormwater Regulations

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Regulation of Foundries

- Iron and Steel Foundries NESHAP
 - 40 CFR 63, Subpart EEEEE
 - Applicability
 - Constructed on or after December 23, 2002
 - Major source of hazardous air pollutants (HAPs)
 - Melts iron and/or steel
 - Pours into molds to produce final or near final shape products
 - Work practice standard
 - Program
 - Scrap selection and inspection
 - Acquisition and certification

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Regulation of Steel Mills

- EAF Rule
 - Not promulgated (proposal anticipated ~12/06)
- Regulates steel "mini" mills
 - Impacts upstream brokers, shredders, crushers and yards
- Limits mercury and other pollutants
 - Concentration standard
 - Work practice standard
- Options for compliance demonstration
 - Install costly control equipment
 - Install continuous emission monitors
 - Conduct routine performance testing
 - Purchase "reduced mercury shred"
 - Combination/varying degrees of above

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EPA's Significant New Use Rule (SNUR)

- Proposed: 71FR39035
- Toxic Substances Control Act
- Targets Hg^o used in convenience lighting switches, ABS, active ride control system switches
- Switch manufacturers or processors

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SNUR Requirements

- 90-day prior notification to EPA of intention to manufacture or process Hg for such purpose
 - EPA evaluation
 - Opportunity to prohibit or limit

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National Vehicle Mercury Switch Recovery Program (NVMSRP)

- Key components
 - No bounty; possible reimbursement
 - Auto manufacturers provides:
 - equipment
 - guidance documents
 - Auto and steel manufacturers pay for:
 - collected switch transportation
 - recycling costs
 - Limited resources to existing, self-funded programs



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NVMSRP Background

- MOU – August 11, 2006
- Parties
 - Manufacturers
 - Ford
 - GM
 - DaimlerChrysler
 - BMW
 - International Truck and Engine
 - Mitsubishi
 - Nissan
 - Subaru
 - Volkswagen
 - Volvo
 - Parties (cont'd)
 - Automotive Recyclers Association (ARA) - vehicle dismantlers
 - Institute of Scrap Recycling Industries (ISRI) – scrap handlers
 - EPA
 - American Iron and Steel Institute (AISI)
 - Steel Recycling Institute (SRI)
 - Steel Manufacturers Association (SMA)
 - Environmental groups
 - Environmental Council of States (ECOS)

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MOU Roles & Responsibilities

- Vehicle Manufacturers
 - Provide funding
 - Ensure
 - Collection from dismantlers/scrap handlers
 - Transportation to retorters
 - Proper recycling of switches

Through the
End of Life Vehicle Solutions Corp.
(ELVS)

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MOU Roles & Responsibilities

- ELVS
 - Identify dismantlers, scrap handlers, crushers
 - Aided by ARA, ISRI, State agencies, others
 - Recruit into NVMSRP
 - Provide educational materials
 - Arrange/pay for transportation to retorters
 - Accept switches from participants
 - Arrange/pay for recycling of switches
 - Assume liability for Hg collected

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MOU Roles & Responsibilities

- ELVS (cont'd)
 - Establish process for enrollment into NVMSRP
 - Maintain database
 - Maintain website
 - Report quarterly to MOU parties
 - Take lead marketing NVMSRP
 - Establish/maintain system to disburse funds
 - Make timely payments

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MOU Roles & Responsibilities

- SRI & SMA
 - Endorse NVMSRP publicly
 - Encourage members to participate
 - Pursue opportunities to acknowledge/recognize members
 - Assist in outreach efforts among "steel scrap supply chain"
 - Work w/ ISRI re: scrap work practice standards consider market and technological factors

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MOU Roles & Responsibilities

- Steelmakers
 - Issue statement per individual steel company - participating in NVMSRP
 - Develop site-specific plan on participating in NVMSRP
 - Promote NVMSRP w/ suppliers throughout "steel scrap supply chain"
 - Encourage suppliers/others to support/participate in NVMSRP
 - Anticipate EAF Rule/other that "may include a compliance option for steelmaking facilities to reduce mercury in scrap feedstock by developing and implementing scrap work practice standards."

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MOU Roles & Responsibilities

- ISRI
 - Endorse NVMSRP publicly
 - Encourage members to participate
 - Pursue opportunities to acknowledge/recognize members
 - Assist in identifying potential participants
 - Assist in outreach efforts among "steel scrap supply chain"

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MOU Roles & Responsibilities

- Participants (crushers, scrap processors, brokers)
 - Submit collected switches at agreed intervals
 - Assist in outreach and education efforts
 - Receive eligible implementation compensation
 - Satisfy work practice standard any steelmaking may establish via good faith participation
 - Train employees

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MOU Roles & Responsibilities

- EPA
 - Consider NVMSRP when regulating EAFs/others
 - Make available opportunities for grants/cooperative agreements/other
 - Communicate NVMSRP importance to affected entities
 - Provide recognition/incentives for performance/participation
 - Participate in evaluation of NVMSRP
 - Effectiveness
 - Data analysis
 - Barriers
 - Explore ways to gain understanding of environmental and economic effects of product design choices

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MOU Roles & Responsibilities

- Environmental Groups
 - Endorse NVMSRP publicly
 - Encourage support of NVMSRP
 - Support outreach/education/oversight activities
 - Participate in development of mercury switch estimates
 - # in vehicles
 - Capture rates
 - Data management
 - Data analysis
 - Reporting
 - Participate in evaluation of NVMSRP

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MOU Roles & Responsibilities

- ECOS and the Quicksilver Caucus (on behalf of States)
 - Endorse NVMSRP publicly
 - Review existing state programs
 - Incentives
 - Lessons learned
 - State contacts
 - Provide existing state programs' information to ELVS
 - Encourage support of NVMSRP in States w/o program
 - Explore coordination of existing programs w/ NVMSRP
 - Encourage providing of list of vehicle recyclers, crushers, shredders and assist in identification efforts
 - Encourage states' monitoring of NVMSRP
 - Communicate importance of NVMSRP to affected entities in partnership
 - Explore opportunities to provide recognition/incentives for performance/participation
 - Participate in development of mercury switch estimates
 - Participate in evaluation of NVMSRP

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MOU Joint Responsibilities

- Collaborate & carry out individual responsibilities in good faith
- Formulate strategy to ensure outreach
- NVMSRP implemented at state level
- No new state legislation other than to correct statutory deficiencies
- No replacement of more stringent existing programs, requirements or responsibilities
- Integration of NVMSRP into less stringent programs

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MOU Implementation Fund



- Parties: vehicle manufacturers and steelmakers
 - Each pay half
- \$4 million for 3 years
- Use/disbursement directed by Implementation Fund Coordination Committee (IFCC)
- IFCC – 4 members represented by:
 - ARA
 - ISRI
 - Environmental groups
 - ECOS

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MOU IFCC Responsibilities

- IFCC
 - Develop procedures/mechanisms for disbursements through ELVS
 - Report expenses to parties annually
 - Independent annual audit
 - Monies contributed in phases to be used for NVMSRP even after 3 year period
 - Additional contributions do not offset funding amounts from manufacturers or steelmakers
 - Disbursements do not require submittal of VINs
 - Possible extension of NVMSRP
 - Limits role of EPA in decision-making

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MOU Accountability and Measuring Progress

- Define success
 - Verifiable measurement and accountability
 - Assessment of NVMSRP progress
- Assess performance
 - Development of state plans
 - Identification and participation of participants

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Assess Program Performance

- First year: 3 month intervals
- Second & Third year: 6 month intervals
- Collective party NVMSRP assessment by state
- Status Indicators
 - State plan implementation
 - # states NVMSRP implemented
 - Web-base info availability & # hits
 - Dismantlers' identification
 - Database development & rate of info collection

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Progress Measurement

- Convenience lighting Hg switches only
- Setting of aggressive recovery rate goal
 - 80-90%
- Achievement of recovery goal in first 3 years
 - <80-90% during ramp-up
 - ≥~ 4 million switches in addition to existing programs' recovery
- Annual assessment using ELVS data (beginning August 11, 2007)
- March 11, 2009 assessment of NVMSRP effectiveness and performance
 - Discuss # switches collected
 - Factors contributing to effectiveness
 - Review disbursement rate from Implementation Fund

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NVMSRP Initiation

- Formal initiation September 10, 2006
 - Parties' responsibilities
- Finalize development of overall implementation plan by December 9, 2006
 - Specific quarterly goals
 - NVMSRP initiation nationally by ~September 10, 2007
 - ELVS lead on "roll-out" plan; others refine
 - Ready for August 11, 2007 annual assessment
- Establish plan to guide NVMSRP implementation
 - Implementation milestones
 - Assessment/review milestones
 - Public availability

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NVMSRP Duration

- Implemented until:
 - December 31, 2017 (when 90% of vehicles w/ Hg switches are retired)
 - OR
 - Determine no longer significant source of mercury
- Extension

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NVMSRP Limitations

- Withdrawal from MOU
 - 90 days notice
 - Seek resolution
- No creation of right or benefit
- Does not directly apply to anyone but parties
- EPA/ECOS/States commitments subject to funding availability
- No compensation of resources to parties from EPA
- EPA/ECOS/States cannot endorse purchase/sale of commercial products

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Other Limitations

- Limited assistance to existing &/or self-funded programs
- Separation of data from new & existing programs
- Vague goals
- Delayed timelines
- Not binding

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CO's Switch Removal Program

- Background
- Characteristics
- Roles & responsibilities
- Metrics
- Status
- Next Steps
- Recommendations



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Background

- Opportunity
 - Funding
 - TRI reporting
 - Established pollution prevention programs
- via supplemental environmental projects (SEPs) totaling \$500K, through CF&I Steel L.P. - MUST benefit Pueblo, CO

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Key Program Characteristics

- Voluntary
- Focus on convenience lighting switches
- Focus on end-of-life vehicles
- Equipment, guidance & incentives provided by CDPHE
- Paid switch transportation and recycling costs
- No bounty



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Incentives



- Free training, equipment & guidance
- Pre-arranged and pre-paid recycling costs
- Temporary stay of routine compliance inspections (air, cfc, stormwater, waste)
- Enforcement discretion
- Compliance assistance
- Recognition
- Preparation for national program &/or EAF Rule
- Add value to product (market-based incentive)

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Current Roles



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CDPHE's Involvement



- Provide training, guidance and basic equipment
- Grant contract for Program Administrator
- Provide incentives
- Work to further **voluntary** efforts
- Set & evaluate collection rate goals

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Participants Involvement



- Remove switches from end-of-life vehicles (ELV)
- Properly store and recycle collected switches
- Recycle via "CDPHE-approved" facility
- Maintain records
- Provide periodic Program input

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Program Administrator's Involvement

- Collect switches (pick-up, drop off, mail) and CDPHE form from participants
- Comply with applicable regulations (RCRA, DOT, etc.)
- Ship switches to disposal/recycling site (recyclable products)
- Invoice CDPHE for transport and disposal/recycling costs
- Report to CDPHE

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CF&I Steel L.P. Involvement

- Support Program
- Provide info on annual shred purchases
- ??Mandate percentage of shred accepted come from recyclers who remove switches
- ??Help extend the life of the Program
- ??Help expand the Program

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Metrics & Goal Setting

- Data
 - Number of participants
 - Vehicle processing rates
 - Number of switches/vehicle
 - Weight per switch
 - Amount of Hg/switch
 - Container tare weight
 - Amount of shred tons received by steel mill

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Data Tracked

- Number of participants
- Annual vehicle processing rate
- Percentages of categories
 - Damaged or crushed/dage/foreign/hood-only
- Pro-rated annual switch collection goals
 - Participant
 - Program
- Date of shipment
- Weight of switch collection per participant
- Annual vehicle processing rates
- Annual switch collection rate
- Percentage of actual switch collection rate to goal
 - Participant
 - Program
- Amount of shred tons received by steel mill
- Percentage of shred received
 - In-state
 - Out-of-state
- *Number of vehicles received at steel mill from Program participants*



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Recordkeeping & Data Interpretation

- Responsibility
- Quality & Accuracy
- Confidentiality
- Reporting
- Data Entry & Handling
- Collection Determination
- Data Review
 - Collection efficiency
 - Participant start date
 - Collection timeliness
 - Reporting timeliness

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Status

2004

- Participants: 25*
- Vehicles processed: 78,000 est.
- Goal: 25,439 switches collected
- Results: 33,880 switches collected

2005

- Participants: 40*
- Vehicles processed: 95,000 est.
- Goal: 40,175 switches collected
- Results: 26,049 switches collected

* Including all 5 shredders in CO

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Impacts on Metrics

- Program newness
- Removal commencement
- Niche
 - Damaged or crushed
 - Age
 - Foreign
 - Hood-only
- Removal commencement
- Data quality & accuracy
- Participant's approach
 - Sweep vs. upon arrival
 - Frequency
- Overlap
 - Yard, crusher and shredder may all process same vehicle
- Collection timeliness

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2006 Goals

- Statistical:
 - Participants: 45
 - Goal: 41,000 switches collected
- Logistical:
 - Improve Administrator's service
 - Set up system to correlate pollution reductions to CF&I Steel L.P. (implement 2007)
- Other:
 - Expand Program



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Resources

2004-2005:

- Spent ~\$15,000 in equipment, supplies, meetings, & Administrator fees
- ~0.7 FTE – CDPHE dedicated staff
- Captured ~60,000 switches or 130 lbs. of mercury

Future:

- Program expansion impacts vary
 - Participation in ECOS
 - Integration of NVMSRP
 - CO MACT for CF&I Steel, L.P.
 - Staff time/switch collected may increase
- 15 year problem

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Program Evaluation

- Goal setting
- Recordkeeping
- Data interpretation
- Improvements
- Expansion

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What's Working & What's Not

Working:

- Voluntary
- Simplicity
- Peer-to-peer involvement
- Relationship w/ associations

Not Working:

- Temporary stay of inspections
- Collection
 - Service
 - Timeliness
 - Data reporting
- CDPHE outreach to non-participants
- Direct correlation to CF&I Steel, L.P.

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Program Expansion



- CF&I Steel L.P. involvement
 - Mandate
 - Added value to "reduced mercury shred"
- Key states' 5 largest yards
- Portable crushers
- In-state non-participants

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Next Steps

- Improve Collection Process
- Integrate NVMSRP
- Re-evaluate Program
- Expand Program



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Recommendations to Develop & Implement a Switch Removal Program



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Recommendations

- Involve the scrap entities and local associations immediately
- Administer program using peer-to-peer methodology
- Participate in NVMSRP
- Conduct outreach and provide guidance materials
- Identify regulatory impacts of participants prior to approaching them

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Recommendations (cont'd)

- Make use of Universal Waste Rule
- Do not create new regulations
- Rely upon existing studies
- Provide incentives
- Try voluntary program first
- Provide some equipment and basic tools to participants

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Recommendations (cont'd)

- Make use of ELVS' data tracking/reporting
- Conduct up-front sweeps
- Reinforce recordkeeping methodology/consistency
- Include buffer when setting program goals
- Set individual collection goals per participant

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In Summary

- Get involved with ECOS, and thus with the NVMSRP
- Establish contact with ELVS
- If you don't have a program – start one
- If you have a program – integrate the NVMSRP
- Set specific goals and establish metrics
- Track and report progress
- Periodically evaluate program

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For Further Information

- MOU:
<http://www.epa.gov/mercury/pdfs/switchMOU.pdf>
- CO's website:
<http://www.cdphe.state.co.us/hm/mercury/>
- Contacts:
CO Dept. of Public Health & Environment
Dena Wojtach @ (303)692-3147 OR dena.wojtach@state.co.us
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Questions



- Are salvage entities removing switches in your states?
- Who here has implemented a switch removal program? Can you tell us about it?
- Are there any states here that have implemented a mandatory program? Can you tell us about it?

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