

# A Fine Problem – PM 2.5 Case Study



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NACAA Permitting Workshop  
July 14, 2009



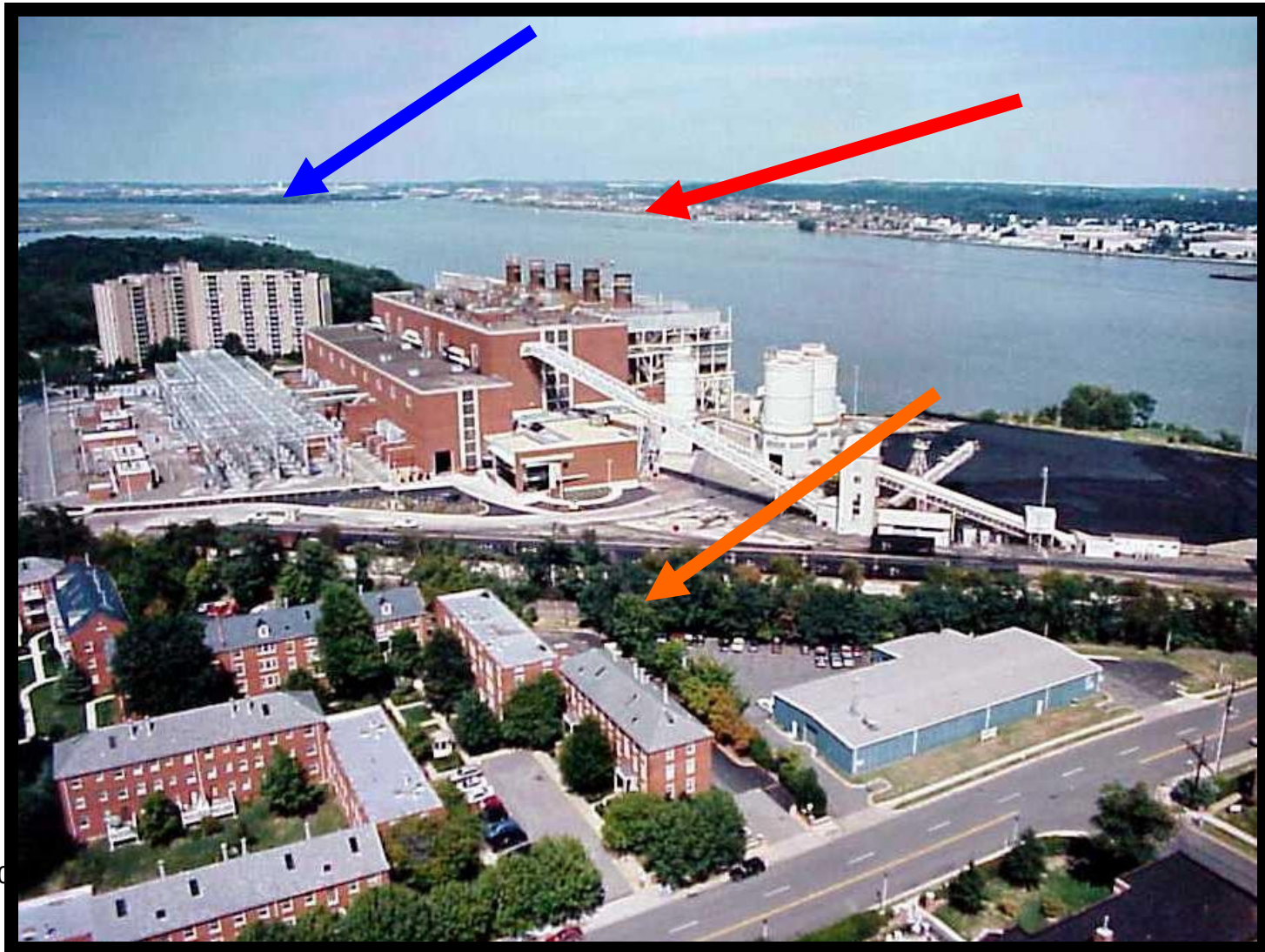
# Set-Up



- Potomac River Generating Station (Mirant)
  - Located In Alexandria, Virginia
  - Coal-Fired (5 Units) – 482 MW
  - Built in 1949 -1957
  - Very Short Stacks
  - Hot and Cold Side ESPs
  - Located in Annual PM2.5 Non-attainment Area
    - Northern Virginia Part of DC MSA
  - HOWEVER – All Virginia Monitors Have Always Shown Attainment for the Annual Standard
  - In Attainment for the 24-hr Standard

# Location, Location, Location

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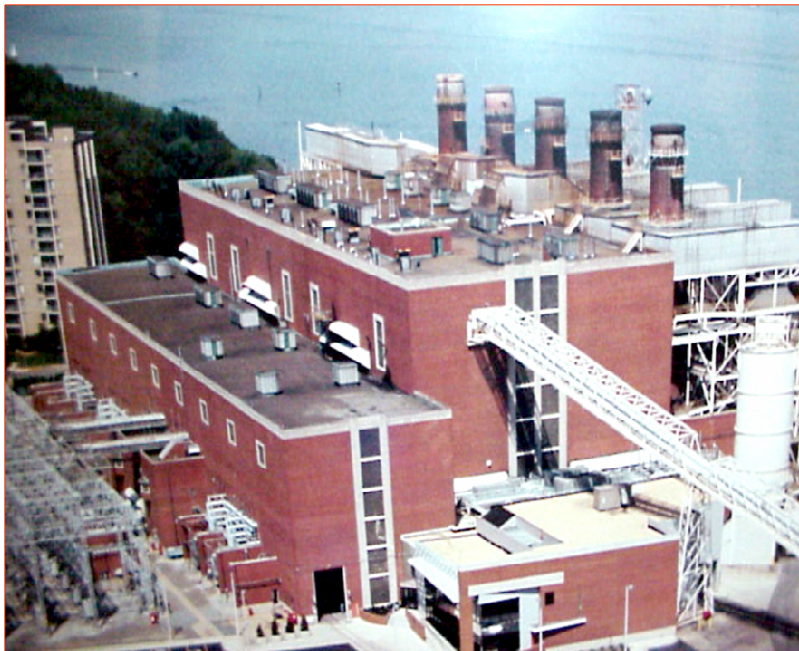


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# Two Sources of PM<sub>2.5</sub>

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## Stack Emissions



## Fugitive Emissions





# Is There A Problem?

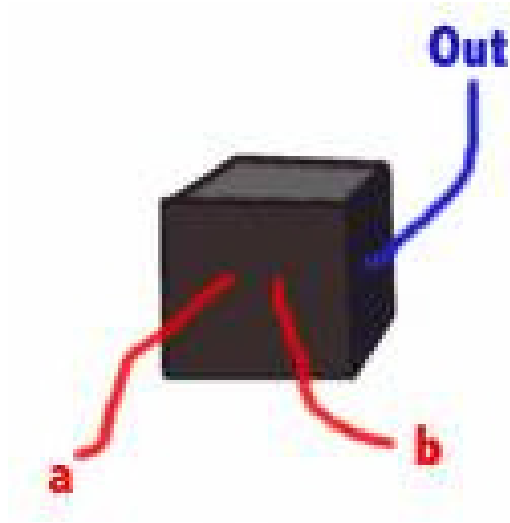
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- ❑ Adverse Relationship Between Plant and City/Citizens
- ❑ City/Citizens Concerned PM2.5 Health Risk
- ❑ Area Monitors Show Attainment
- ❑ Concerned the Monitors Aren't Located in Correct Areas
- ❑ Requested More Monitoring and Modeling Be Conducted

# Not a Model Situation

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***"All models are wrong, but some are useful" – George Box***



# Not a Model Situation

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- ❑ No Final PM2.5 Modeling Guidance
- ❑ Problems With AERMOD
- ❑ Difficult Location – Lots of Downwash – Affects Model Performance
- ❑ Background PM2.5 Levels Are Close to the NAAQS
- ❑ No PM2.5 Inventory Data
- ❑ Unreliable Emission Factors –Esp. Fugitive
- ❑ Wide Variation of Modeling Results



# Monitoring the Situation



- ❑ PM2.5 Monitor Temporarily Located on Top of Marina Towers
- ❑ New Monitor to be Located Based On Agreement Between Mirant & City
- ❑ Monitors Did Not Show and Have Not Shown a NAAQS Exceedance
- ❑ Still – Concerns Remained

# Two Part Resolution

## Part 1 - Permit

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- ❑ State Operating Permit
- ❑ Merging 5 stacks into 2 stacks  
Better Dispersion
- ❑ EPA/Virginia Policy  $PM_{10} = PM_{2.5}$
- ❑ Virginia Air Pollution Control Board –  
Assumed Permit
- ❑ Separate  $PM_{2.5}$  Limit Added to Permit

# Permit Continued

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- PM2.5 – Including Condensables
  - 207 tpy
- PM10 – Including Condensables
  - 325 tpy
- “...the final PM2.5 emission limits shall be based on demonstration of performance of equipment to control particulate matter emissions using results of stack test conducted following a reasonable shakedown period...”

# Two Part Solution

## Part 2 – Negotiated Agreement

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- Agreement Between Mirant & City of Alexandria
- VADEQ is Not a Signatory
- Capital Improvements
  - Phase 1 - Fugitive
  - Phase 2 - Stack

# Negotiated Agreement Continued

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- ❑ Mirant Established an Escrow Account - \$34M
- ❑ Mutually Agreed Upon Engineer
- ❑ Mirant Will Spend a Maximum of \$2M on Agreed Upon Fugitive Controls
- ❑ Plans Developed for Additional PM2.5 Stack Controls Must Be Approved By the City
- ❑ Agreed Upon Controls Will Be Incorporated Into a Permit



# Today

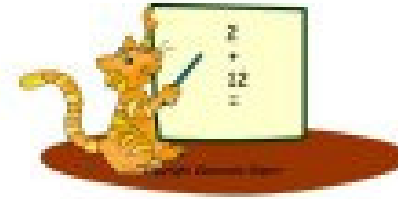
July 2009						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			<b>1</b> Canada Day	<b>2</b>	<b>3</b>	<b>4</b> Independence Day
<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>
<b>12</b>	<b>13</b>	<del><b>14</b></del>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>
<b>19</b>	<b>20</b>	<del><b>21</b></del>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>
<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>	
<<<			www.timebees.com	Red = Federal Holiday U.S.		>>>

- The Stacks Have Been Merged
- Stack Testing is Proceeding
- Engineering Firm/Consultant Selection Proceeding
- Regional PM2.5 Monitors Continue to Show Attainment

# Summing It Up

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What is the sum?



- PM2.5 Modeling Presents Many Challenges
- PM2.5 Emission Factors Need to be Refined
- PM2.5 Inventories Need to be Developed – Especially Condensables
- **And Most Importantly.....**



**NEVER BUILD  
CONDOMINIUMS OR  
HOUSES AROUND A COAL-  
FIRED POWER PLANT!**