

The background of the slide is a light gray color with several water droplets of various sizes scattered across it. The droplets are rendered with soft shadows and highlights, giving them a three-dimensional appearance. The main title is centered in the upper half of the slide.

QUANTIFICATION OF LEAD IN CHICAGO'S DRINKING WATER AND THE IMPLIED SOCIAL INEQUITIES

JENNIFER ALVAREZ

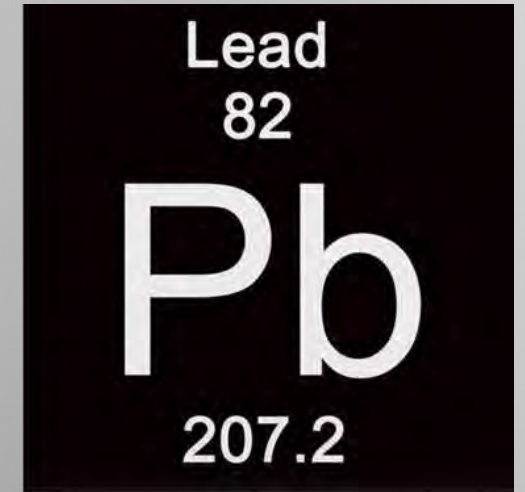
DR. SHELBY HATCH

RESEARCH QUESTION & HYPOTHESIS

- **RESEARCH QUESTION:** “WHICH AREAS OF CHICAGO HAVE GREATER CONCENTRATIONS OF LEAD IN THEIR WATER AND IS THAT ASSOCIATED WITH ENVIRONMENTAL RACISM?”
- **HYPOTHESIS:** SINCE CHICAGO IS RACIALLY SEGREGATED, THE MARGINALIZED AREAS SUCH AS THE SOUTH SIDE AND WEST SIDE ARE MORE LIKELY TO CONTAIN HIGH LEVELS OF LEAD

WHAT IS LEAD?

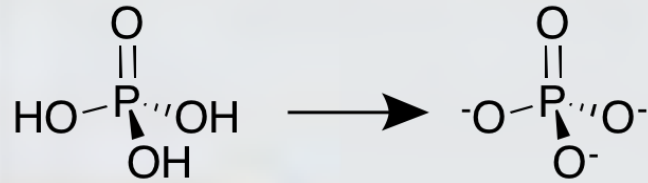
- HEAVY METAL
- ANY AMOUNTS ARE TOXIC
- WHEN INGESTED, GETS STORED IN LIVER AND BONES
- TOO MUCH LEAD IN BODY = LEAD POISONING
- SYMPTOMS
 - STOMACHACHES, HEADACHES, VOMITING, DROWSINESS, LOSS OF APPETITE, CRAMPS, CONVULSIONS
- HIGH LEVELS CAN CAUSE ANEMIA AND NERVOUS SYSTEM DAMAGE



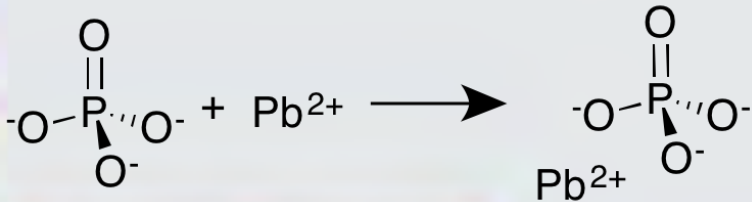
HOW DOES LEAD GET INTO WATER?

- BECAUSE PIPES ARE MADE WITH LEAD!!!
- LEAD PIPES BANNED IN 1986
- NOT REPLACED

How Do Orthophosphates Coat and Protect Water Pipes?



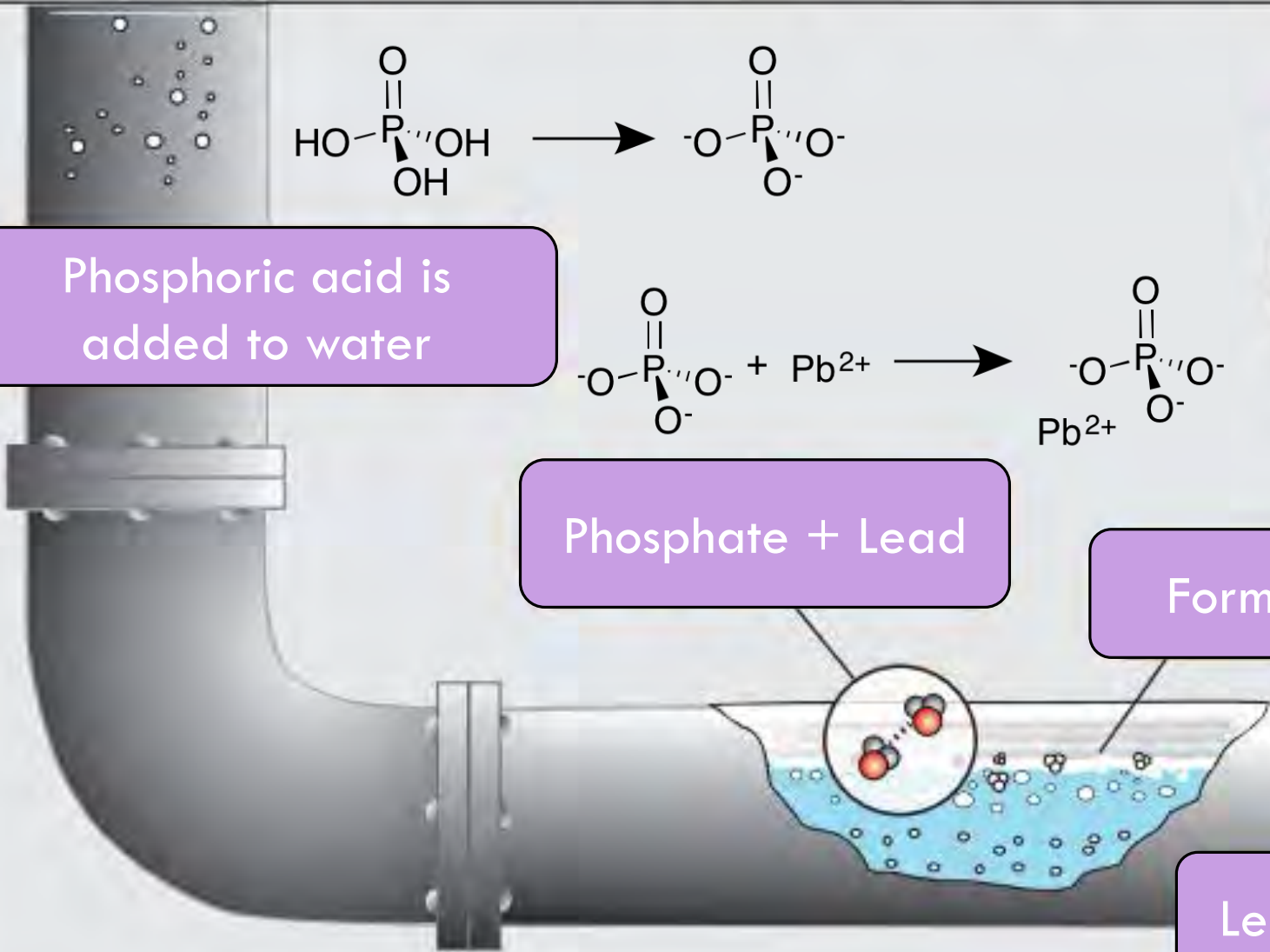
Phosphoric acid is added to water



Phosphate + Lead

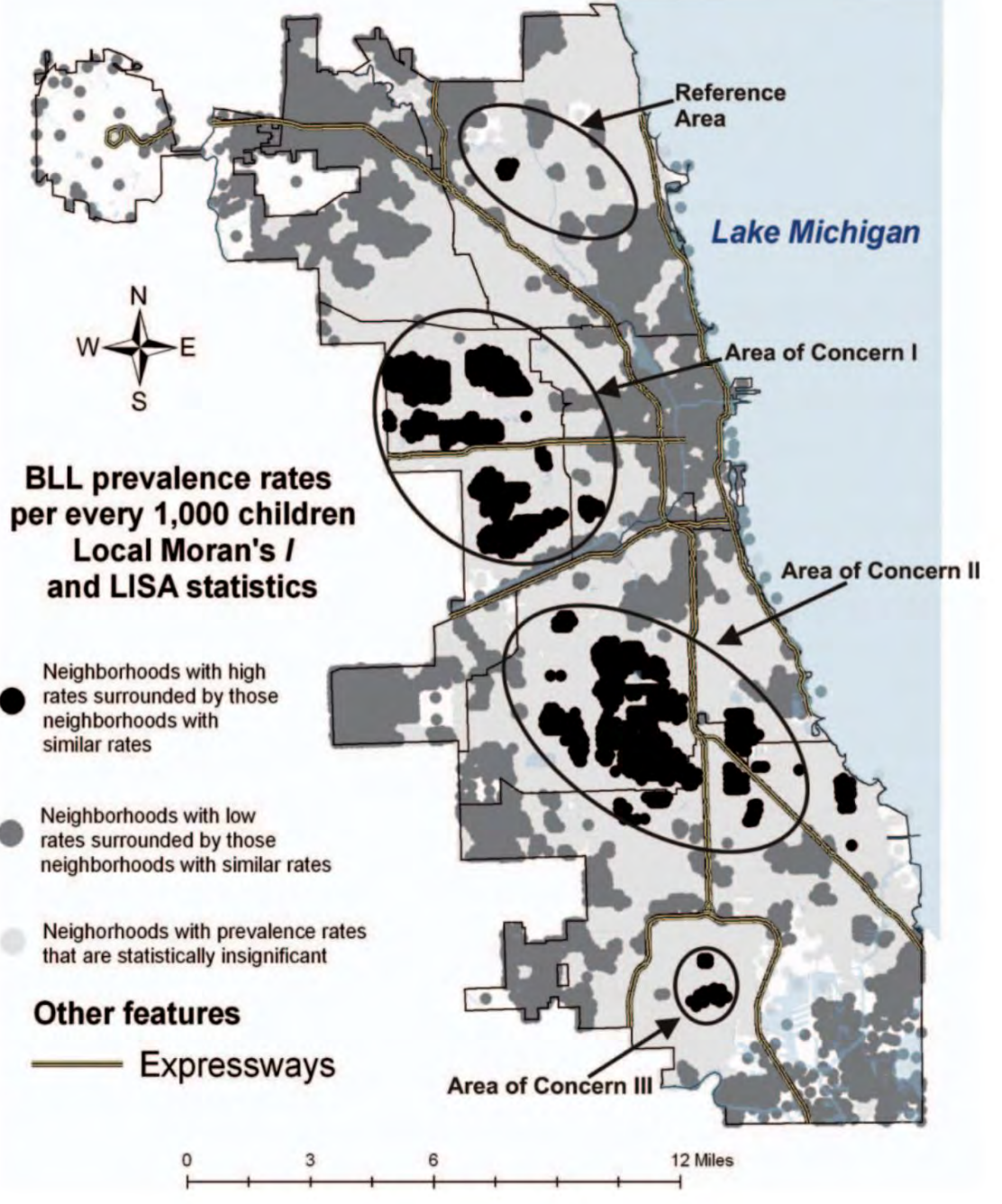
Forms white coating

Lead levels decrease



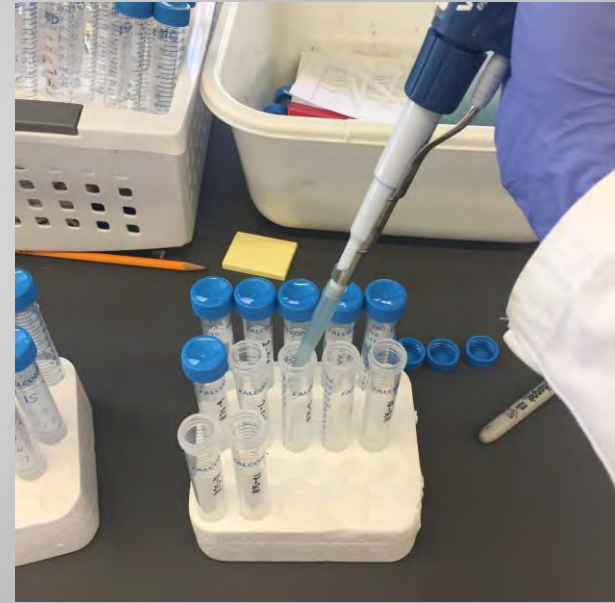
ENVIRONMENTAL RACISM

- MARGINALIZED COMMUNITIES EXPERIENCE WORSE LIVING CONDITIONS
- PEOPLE OF COLOR 47% MORE LIKELY TO LIVE NEAR HAZARDOUS ENVIRONMENTS



METHODS

- WORKED WITH PILSEN ENVIRONMENTAL RIGHTS AND REFORM ORGANIZATION (PERRO)
- SAMPLES COLLECTED FROM PARKS AND RESIDENTIAL HOMES
- STANDARD ADDITION METHODS
- PRESERVED WITH 1 % NITRIC ACID
- ANALYZED WITH INDUCTIVELY COUPLED PLASMA ATOMIC EMISSION SPECTROSCOPY (ICP-AES)



RESULTS & CONCLUSIONS

- ABNORMAL QUANTITY OF LEAD IN SOUTH LOOP

1915 W Wabasha

Lyfe B. White Park

Stanton Park

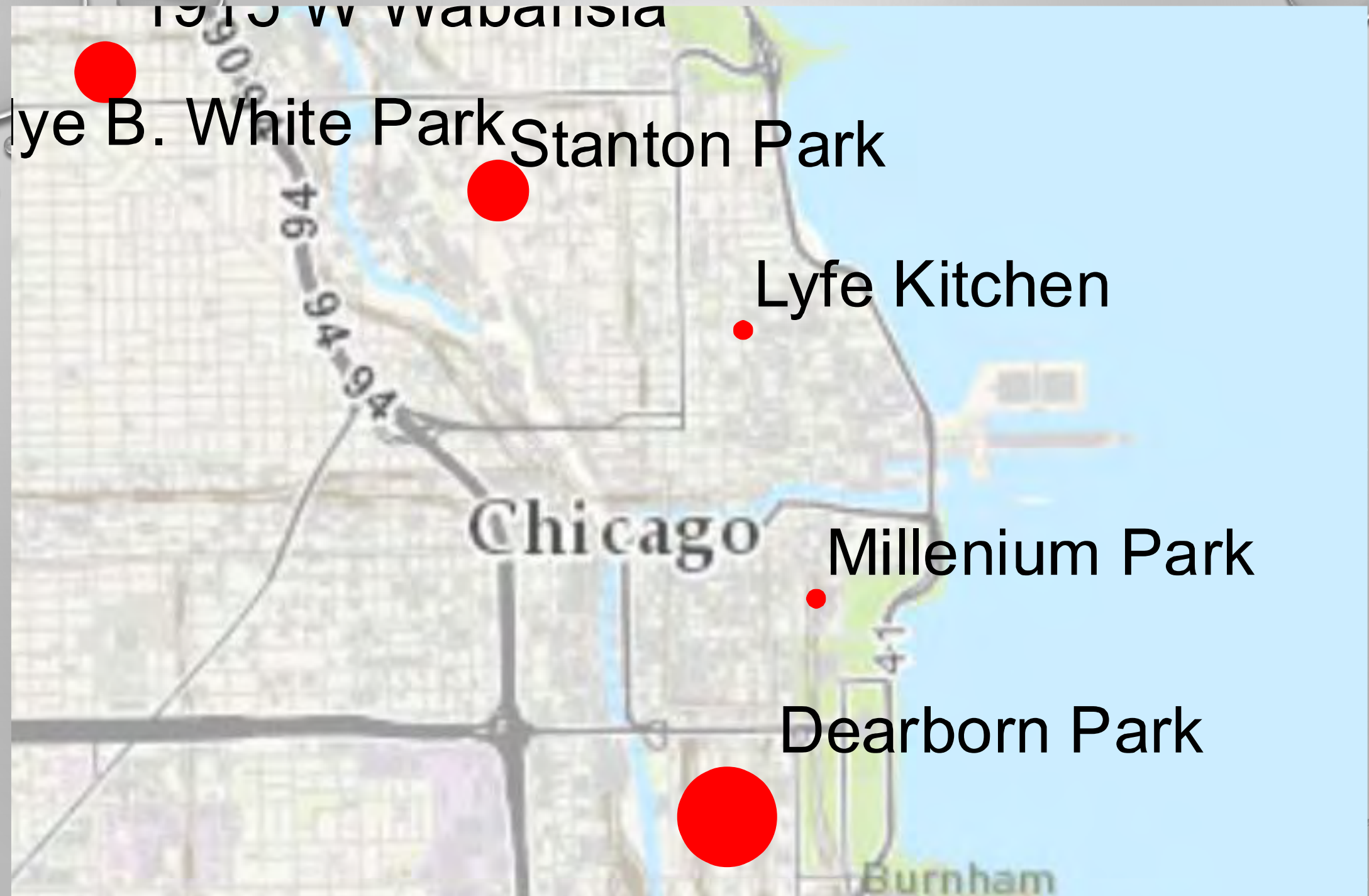
Lyfe Kitchen

Chicago

Millenium Park

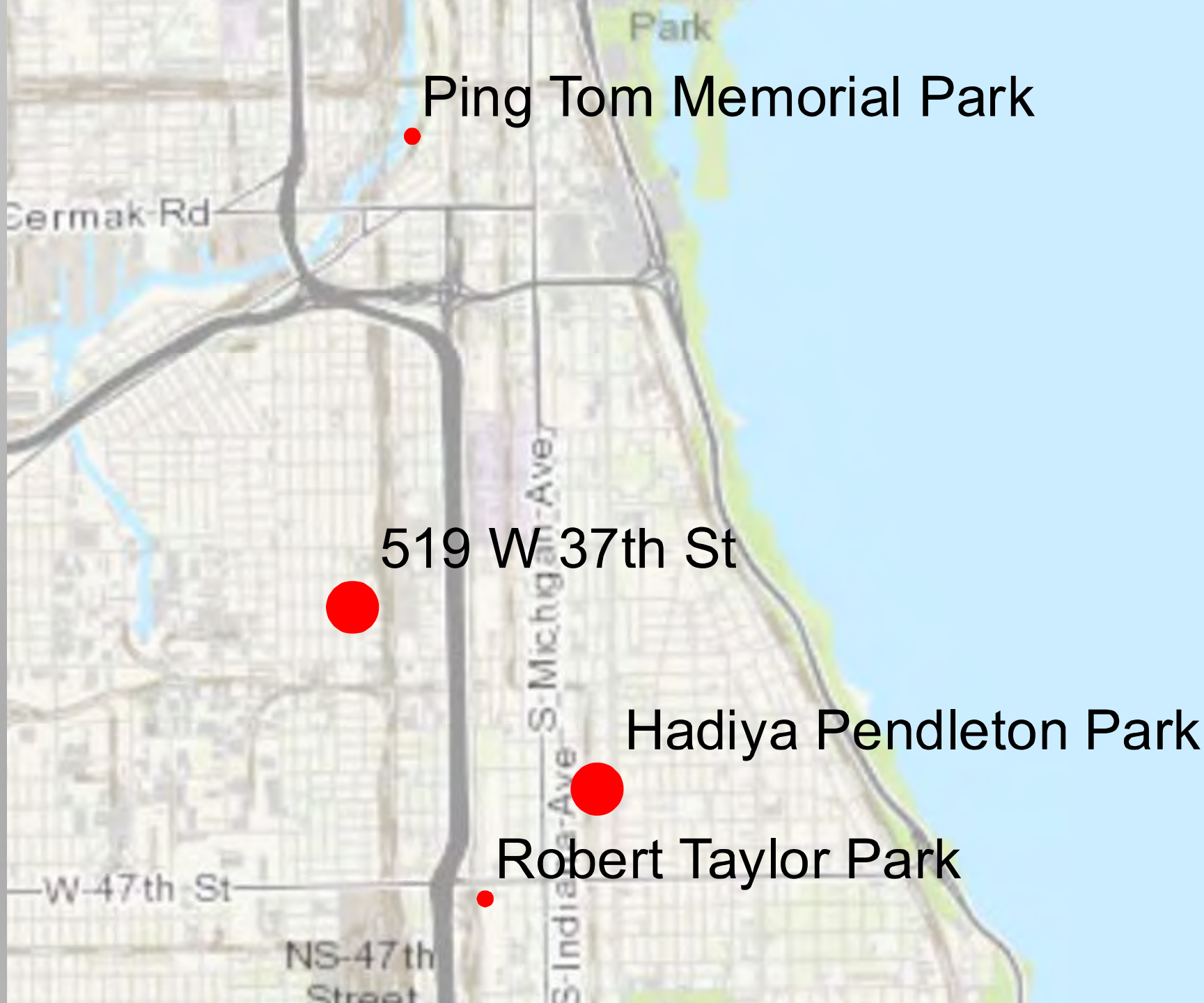
Dearborn Park

Burnham



RESULTS & CONCLUSIONS

- ABNORMAL QUANTITY OF LEAD IN SOUTH LOOP
- PARKS EXPECTED TO HOLD HIGH LEVELS OF LEAD DID NOT



Ping Tom Memorial Park

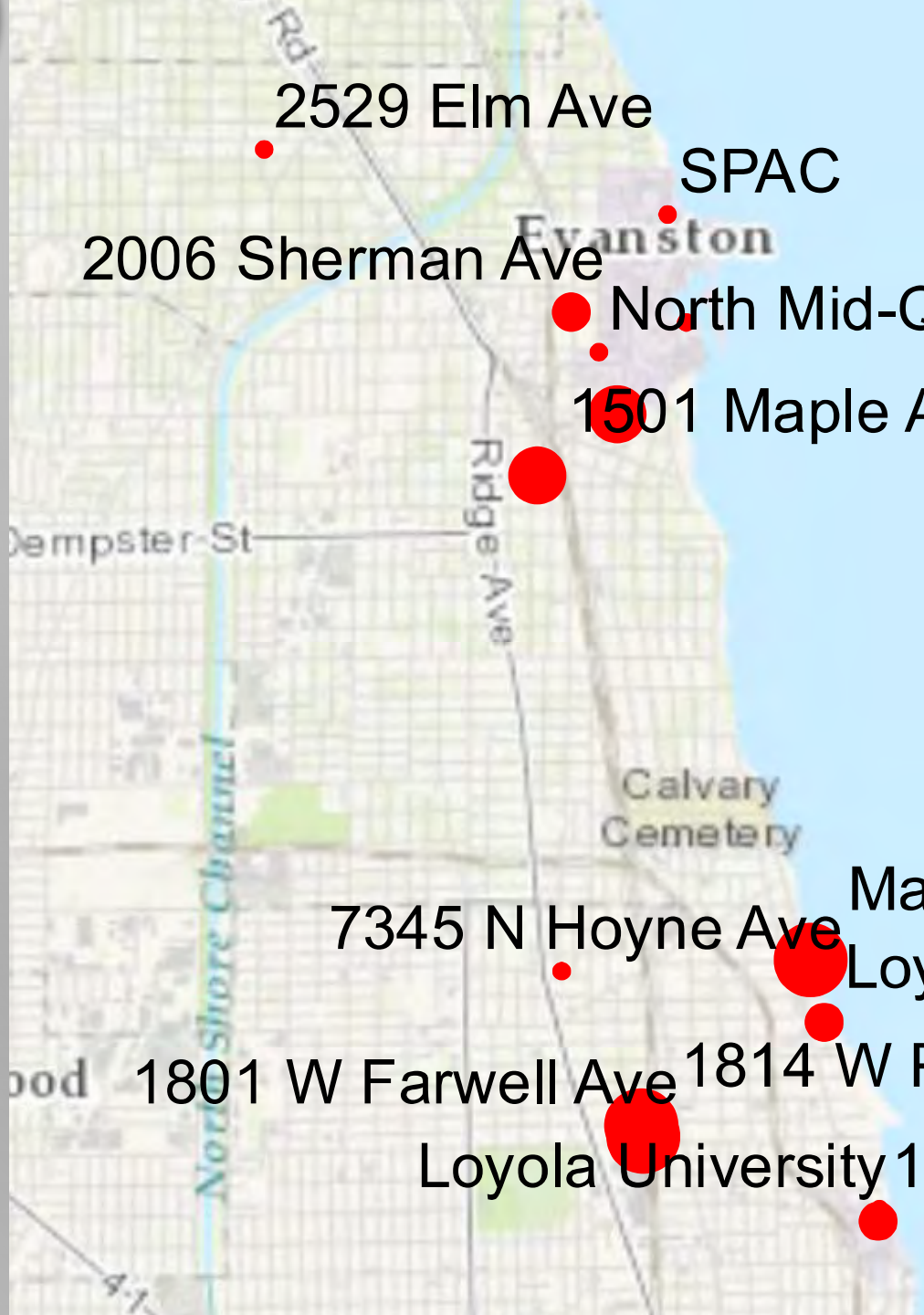
519 W 37th St

Hadiya Pendleton Park

Robert Taylor Park

RESULTS & CONCLUSIONS

- ABNORMAL QUANTITY OF LEAD IN SOUTH LOOP
- PARKS EXPECTED TO HOLD HIGH LEVELS OF LEAD DID NOT
- LEAD HOLDS STRONG PRESENCE IN NORTH



2529 Elm Ave

SPAC

2006 Sherman Ave

North Mid-Quads

1501 Maple Ave



Dempster St

Ridge Ave

Calvary Cemetery

7345 N Hoyne Ave

Marion Mahony Beach Park

Loyola Park

1801 W Farwell Ave

1814 W Pratt Blvd

Loyola University 1033 W Loyola Ave



RESULTS & CONCLUSIONS

- ABNORMAL QUANTITY OF LEAD IN SOUTH LOOP
- PARKS EXPECTED TO HOLD HIGH LEVELS OF LEAD DID NOT
- LEAD HOLDS STRONG PRESENCE IN NORTH
- INCONCLUSIVE RESULTS

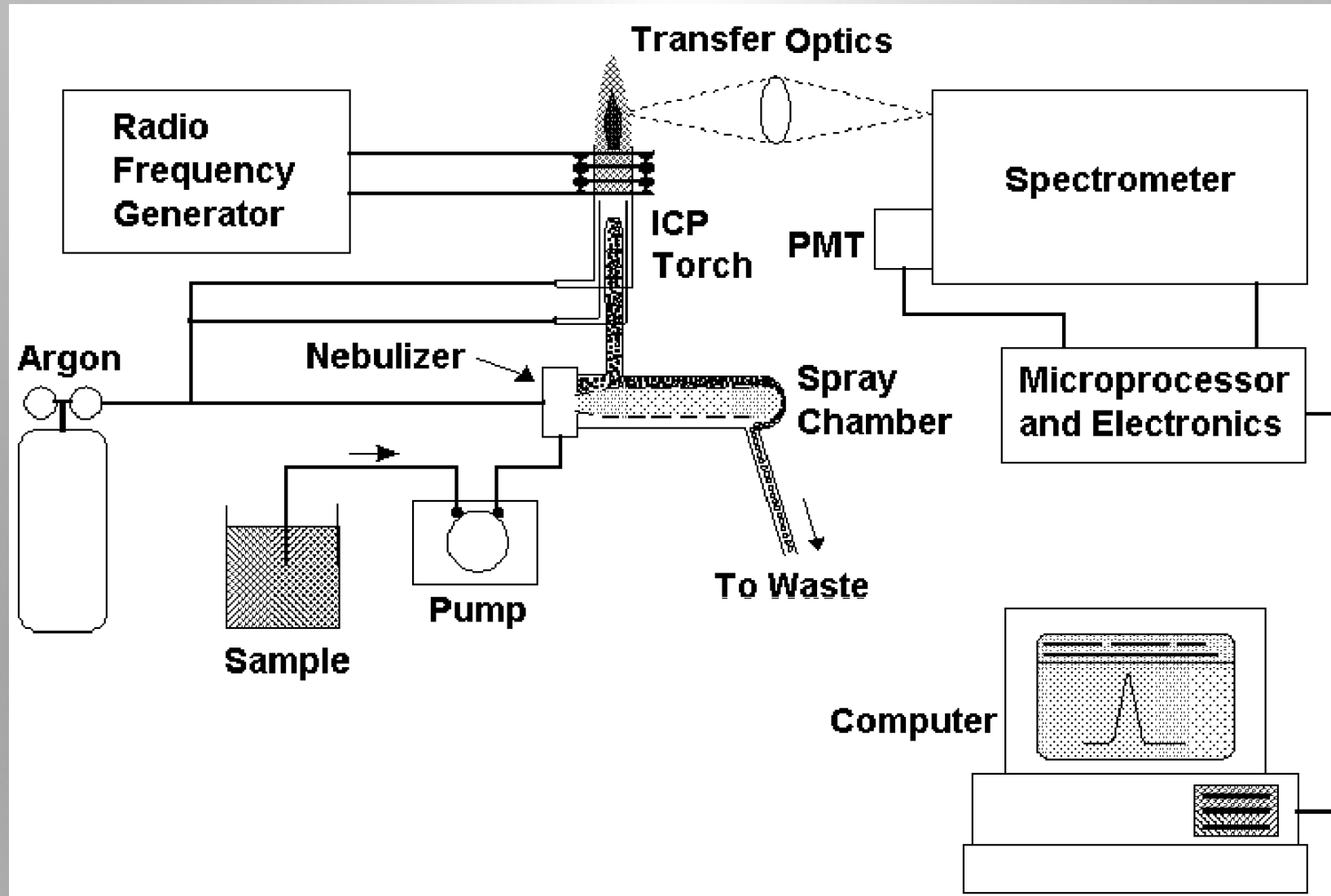
FURTHER RESEARCH

- MY FUTURE PLANS:
 - RESEARCH GRANT
 - COLLECT MORE SAMPLES
 - EXPAND CURRENT MAP

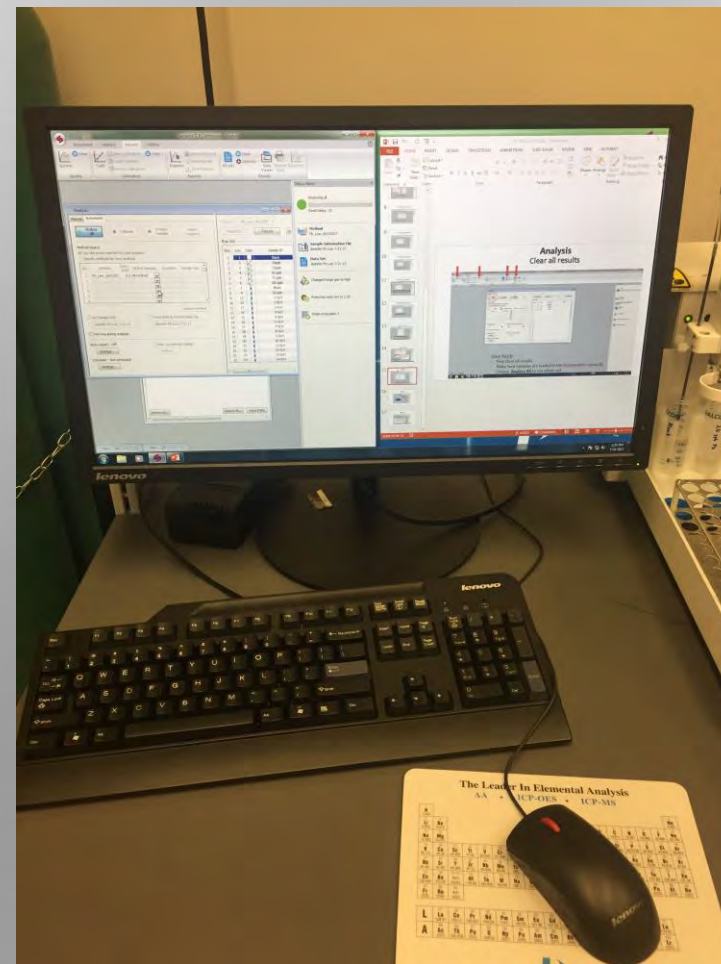
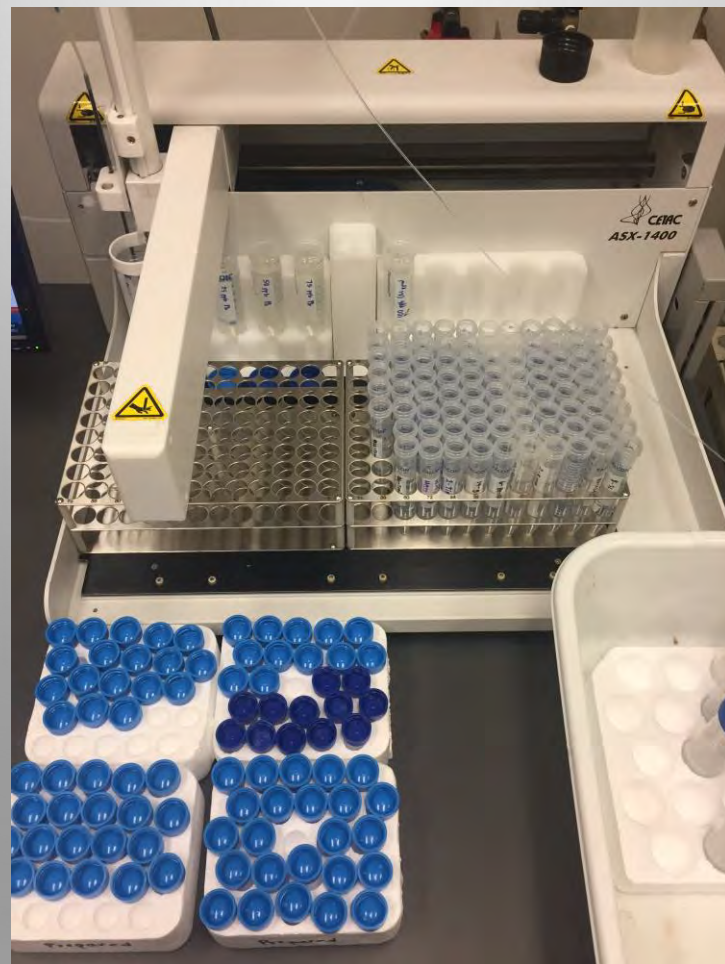
MANY THANKS TO...

- MY MENTOR, DR. HATCH
- LOREN YEAGER
- DR. BERNS
- DR. KNEZZ
- SAMAN SHAFIAIE
- DR. NORTHRUP
- BRIAN POSNER & HIS FAMILY
- PROFESSOR DOMINGUEZ
- CINDY PINGRY
- DEAN FINN
- DEAN RANDOLPH
- PERRO
- MY FELLOW POSNER FELLOWS
- TAMIKA SMITH
- KELSEY RYDLAND
- SODEXO
- MY BOYFRIEND, MARIO
- MY MOM

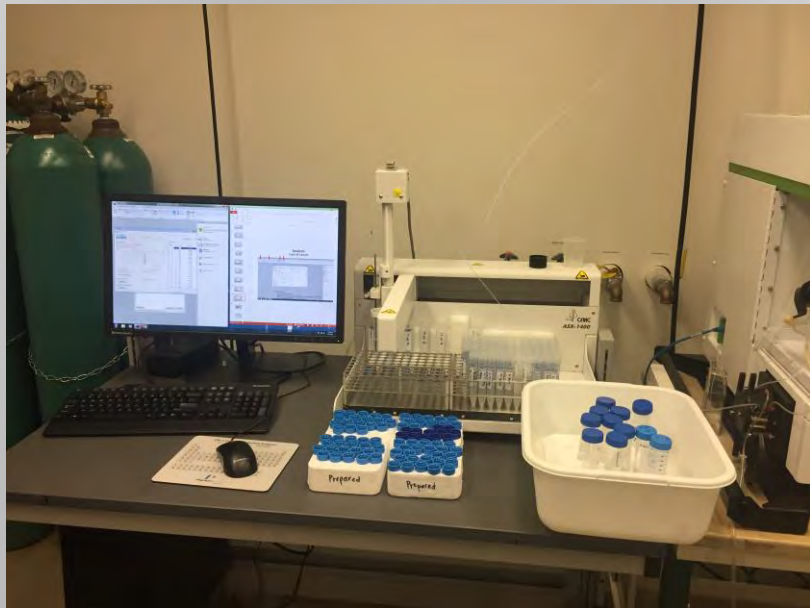
ICP-AES SCHEMATIC DIAGRAM



ICP-AES



MORE ICP-AES



PHOSPHORIC ACID AND WATER REACTION

