



The convergence of science and policy: How the State Geological Survey advanced aggregate protection efforts in Arizona

Eric Mears, R.G.
Mining Market Segment Leader



Rapid growth in Arizona from 1999 to 2009 sets the stage for significant land use conflicts

- Rapid encroachment around aggregate production areas
- Sterilization of known high-quality aggregate resources
- Planners unable to make informed decisions regarding growth
- Growing conflicts regarding dust, noise and health concerns



West Valley conflict reveals the value of AZGS relationship and scientific independence

- Residents near Aqua Fria River aggregate operations frustrated
- Rapidly spread allegations of asbestos in aggregates
- Sampling results (conducted by industry) distrusted by community
- AZGS study effectively resolves issue
- Key learnings:
 - AZGS agile and responsive
 - Results were credible and convincing
 - Independent science highly valued

IS ASBESTOS PRESENT
IN AGUA FRIA RIVER
SAND AND GRAVEL?

Raymond C. Harris

**Arizona Geological Survey
Open-File Report 03-06**

October 2003



Arizona Geological Survey
416 West Congress #100
Tucson, AZ 85701

Arizona's Growing Smarter Act (GSA): An important first-step in addressing aggregate supply in planning decisions

- GSA passed in 1998 and amended in 2000 to assist towns, cities and counties in developing strategies for dealing with population growth.
- GSA requires **General Plans** to address land use, open space, growth areas, environmental planning and water resources.
- Requires each city, town and county to update or re-approve their general plan every ten years.
- Unfortunately, the GSA did not address source or protection of aggregates.



Passed in 2011, the Arizona Aggregate Protection Act (APA) had lofty goals of helping to prevent Land Use Conflicts

SB-1598 amends GSA to require *Planning Agencies* to address sources of aggregates in their General Plans by:



Including sources of currently identified aggregates from existing mapping

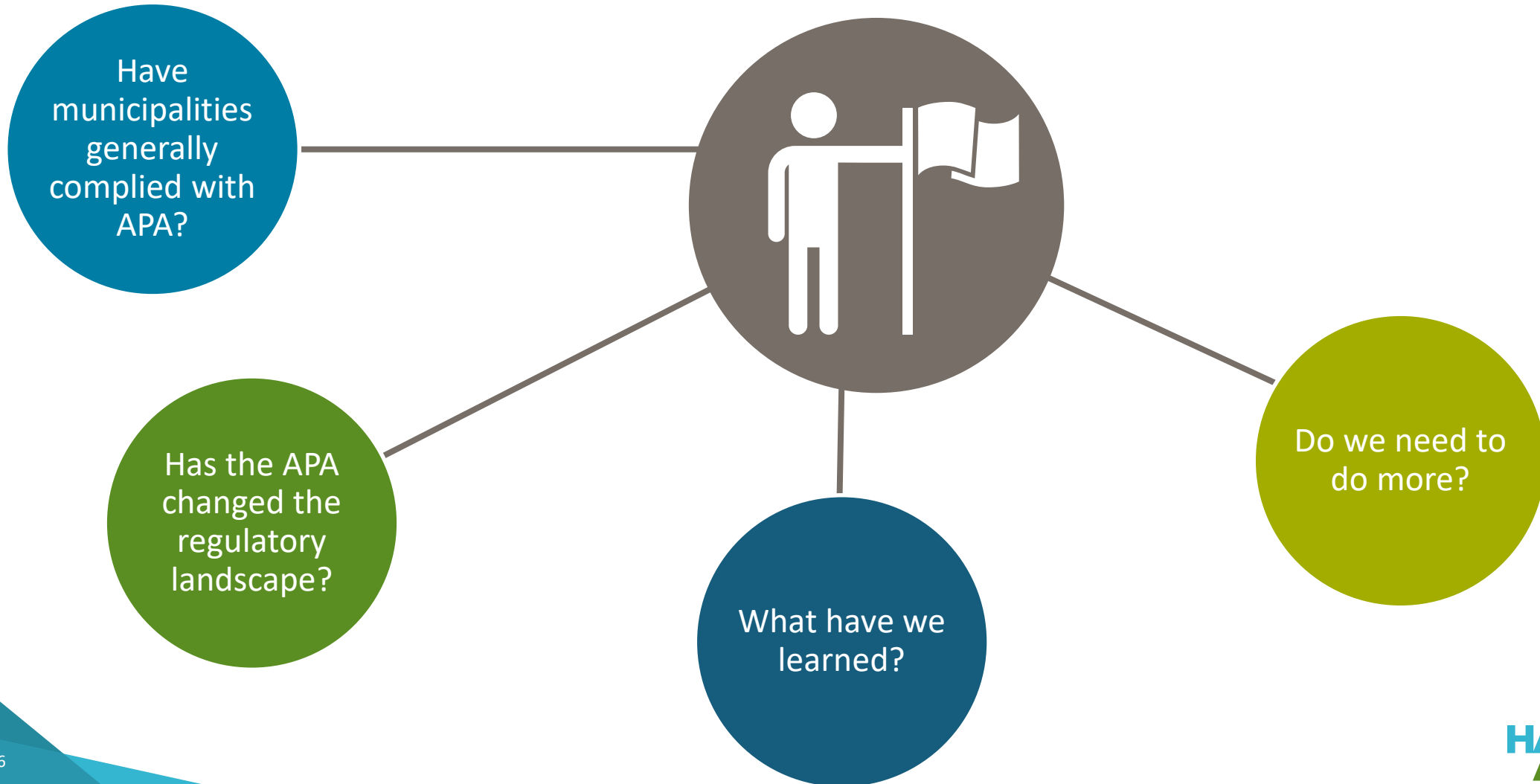


Enacting measures to preserve currently identified aggregates for future development



Enacting policies to avoid incompatible land uses

After reviewing compliance in 2018: Did we declare mission accomplished?



Results of reviewing General Plans of the largest 28 municipalities and 5 counties in Arizona

Only **13 of 28** municipalities have any substantive compliance with APA

Only 9 have identified aggregate sources ***and*** implemented policies protecting those resources

At least 8 municipalities (notably Casa Grande, Marana, Queen Creek, and Kingman) basically failed to comply

Results of reviewing General Plans of the largest 28 municipalities and 5 counties in Arizona

Interestingly,
the 5 biggest counties
generally comply
with APA*

*Although counties can't regulate mining, most have considered policies for protecting aggregate resources and operations

Top 5 reasons for APA non-compliance

5.

General Plans identify active operations but enact no goals or policies to protect them

4.

Failed to identify existing aggregate operations

3.

Cite that *aggregates maps are not available* for the area

2.

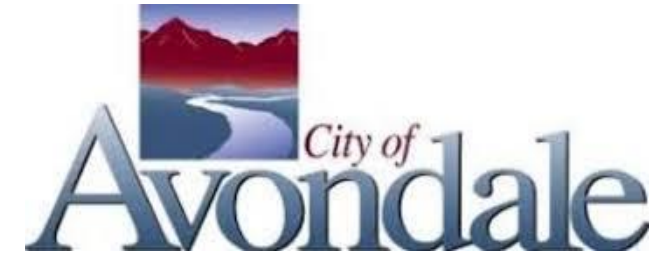
Ignored APA requirements

1.

Have not updated General Plans since enactment

Best practices: Avondale

- Identified the locations of current aggregate operations **from ASMI database**, identified general areas with the potential for future aggregate development, and described active mines in Land Use Element text.
- The owners of potential aggregate resources may apply for the Special Use District (SUD) Overlay as part of the development review but **no guarantee that approval of aggregate mining facilities through the SUD will be granted.**
- For future aggregate sites, the City will work proactively with the ASMI, the property owners, and the operators of these facilities to develop their operation and reclamation plans in a manner that minimizes undesirable land-use conflicts and maximizes the future use.



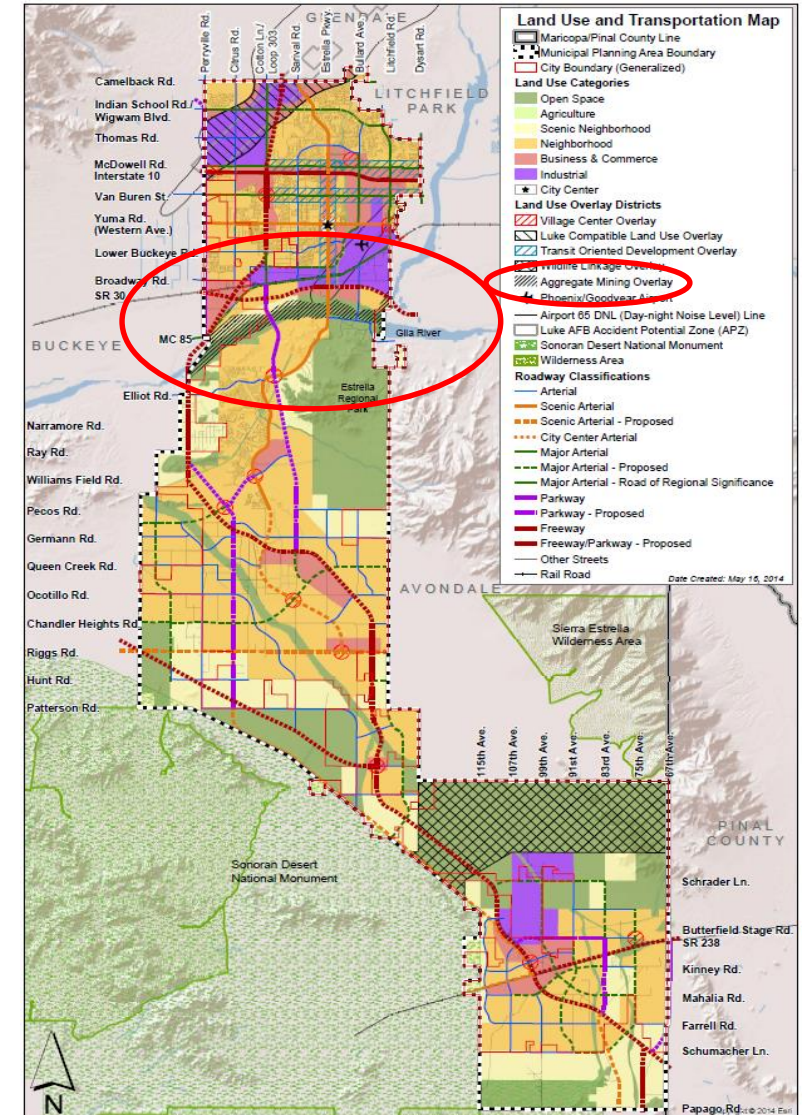
Best practices: City of Glendale

- The City **strives for equal protection** for residential development and aggregate mining operations by promoting compatible land uses in areas of close proximity to existing or planned aggregate and mineral mining operations.
- The City **shall discourage** new residential zoning where future residences would be adjacent to an existing or planned aggregate or mineral mining operation.
- The City **should** promote non-residential development such as business parks and industrial uses adjacent to existing, future, or proposed aggregate or mineral mining operations.



Best practices: City of Goodyear

- Created an **Aggregate Mining Overlay** that denotes sources of currently identified aggregates *as identified by state agencies* and identifies general areas with the potential for future aggregate development.
- The purpose is to disclose to adjoining owners the presence of this resource and the potential for development.
- Identification of these areas does not mean that they may be developed as aggregate mining operations by right. **The property must obtain the proper zoning, permits, and other required permissions.**
- Transportation of materials through the City are restricted to truck routes and may be further limited to protect existing uses. Not all sites within the overlay may be conducive to aggregate mining operations.



Best practices: City of Peoria

GOAL:

To promote compatible land uses in areas of close proximity to existing or planned aggregate/mineral mining locations.

POLICIES:

- Provide **equal protection** for residential development and aggregate mining operations.
- **Discourage new residential development** adjacent to an existing or planned aggregate or mineral mining operation.
- **Discourage new mining operations** adjacent to or in close proximity to existing residential developments, schools, or existing or planned City recreation areas.
- Promote non-residential development such as business park and industrial uses adjacent to existing mining operations.



Best practices: City of Phoenix

GOAL:

To provide **equal protection** for residential development and aggregate mining operations by promoting compatible land uses in areas close to existing or planned aggregate and mineral mining operations.

POLICIES:

- **Discourage new residential** zoning where future residences would be adjacent to an existing or planned aggregate/mineral mining operation.
- **Discourage new mining operations** adjacent to or in close proximity to existing residential development, schools, or existing or planned city recreation areas.
- Promote non-residential development such as business parks and industrial uses adjacent to existing mining operations.
- Update the General Plan Land Use Map to ***recognize existing mining sites when new potential mining sites are identified.***



*“A report prepared for the **Arizona Rock Products Association** estimates that In 2006, Arizona produced 109 million tons of aggregates and crushed stone. Transportation of these materials generated 8.73 million truck trips traveling more than 174 million miles. This required more than 26.7 million gallons of diesel fuel and generated over 506.9 tons of truck emissions.”*

[Click here to read the report.](#)

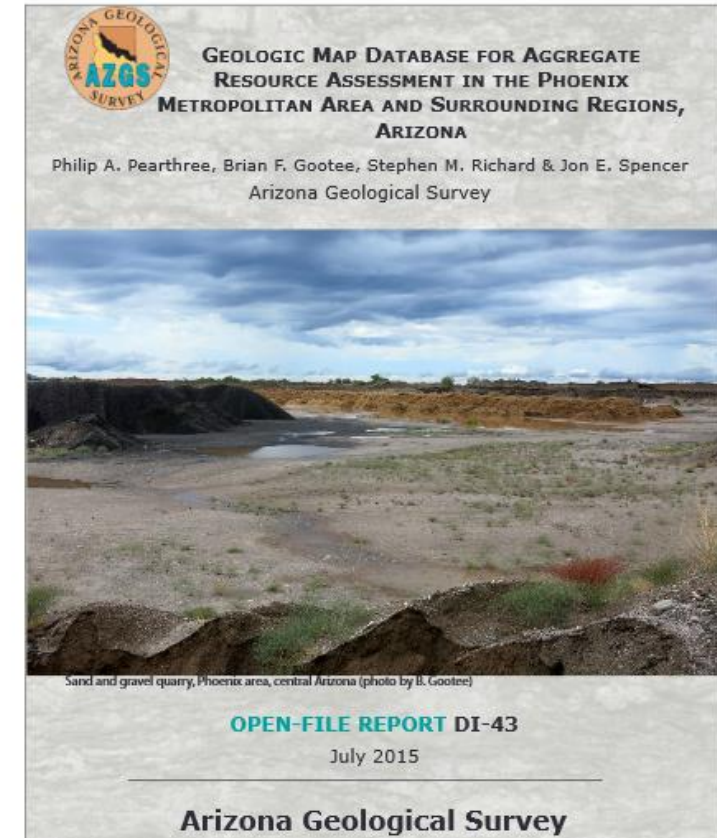
Best practices: Pinal County

- Identify sources of aggregates in the Comprehensive Plan ***when maps identifying such resources become available from State Agencies.***
- ***Once aggregate resource maps become available*** from State Agencies, identify policies to preserve the resources to the extent that the aggregates will be needed for future development.
- **Protect aggregate mining opportunities** while also safeguarding residents' quality of life.
 - Use open space, land use transitions, and other techniques to provide appropriate buffers between aggregate mining and residential land use.
 - Encourage appropriate buffers to mitigate conflicts between aggregate mining and residential land use.
 - Encourage mines to identify and protect key open spaces, corridors and linkages during mine planning.
 - Encourage mining operations to adopt noise reduction programs.
 - Encourage mine reclamation that supports the Comprehensive Plan.
- **Promote appropriate post-mining land use**
 - Encourage the use of closed aggregate mines for parks, trails, and open spaces where appropriate.



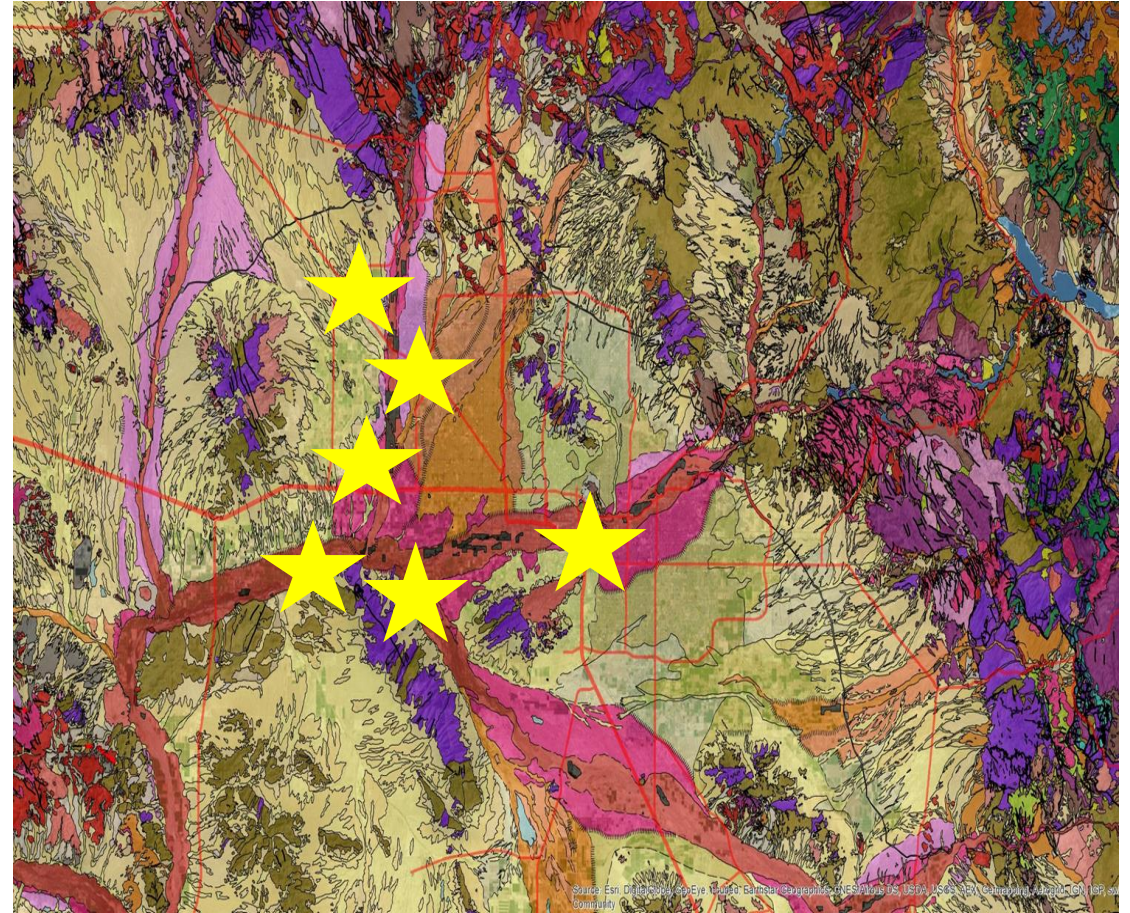
Best-in-class compliance with APA highly correlative with AZGS Aggregate Resource Assessment

- STATEMAP product recommended by the AZGS Mapping Advisory Committee
- Largely a compilation of existing mapping products with some field verification
- Highly collaborative effort with rock products industry
- Assisted planners by clearly correlating geology with aggregate resources



What was the real impact of the STATEMAP product?

- Influenced policies and future development actions of:
 - The largest metropolitan area (and aggregate consumer) in Arizona
 - Four of the most populous cities in AZ (Phoenix, Surprise, Peoria and Glendale)
 - The fastest growing city in the United States (Phoenix)
- More importantly, it weakens arguments of others that aggregate protection can't be done



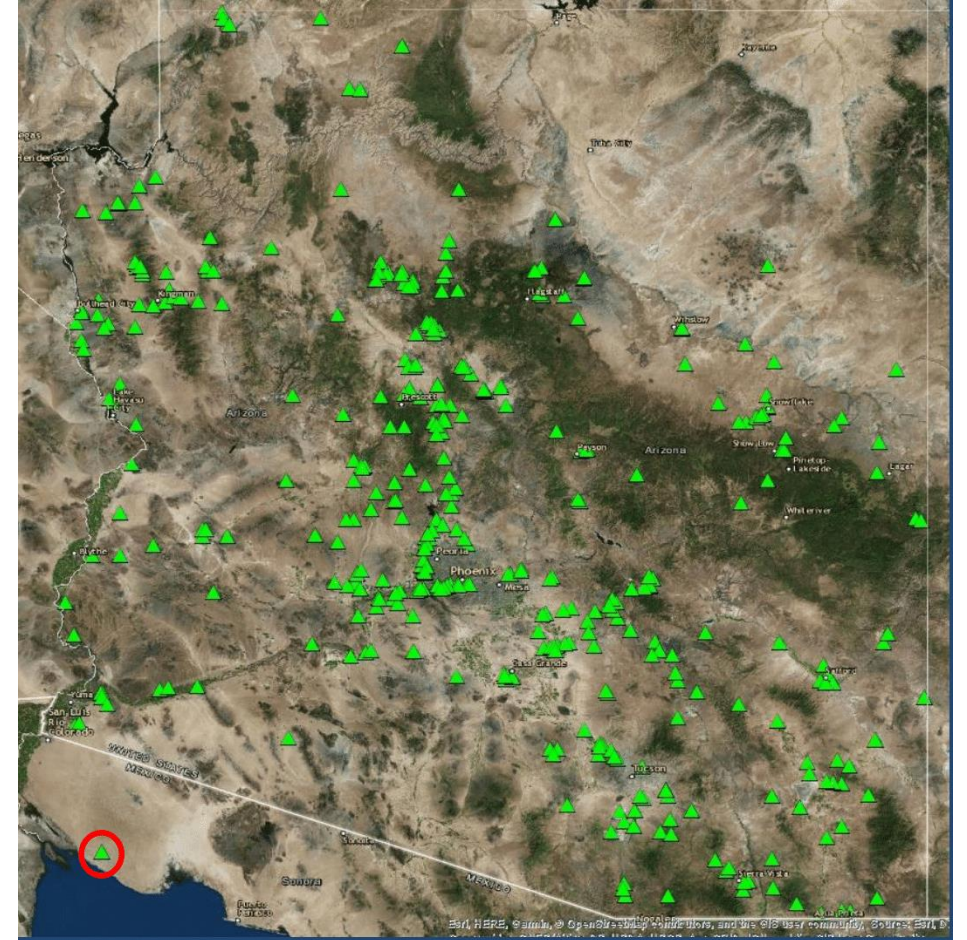
General area of AZGS resource mapping

Although some progress had been made, our 2018 study suggested that significant issues remained

- Aggregate resources still commonly conflict with many greenbelt, wildlife corridor, and open space designations in General Plans.
- Zoning Overlays are great, but not as great as overlays **with** conforming use designations.
- Many entities **used lack of mapping** to avoid APA requirements and many areas lack adequate resource mapping.
- AZGS mapping was extremely effective, but additional STATEMAP funding declined for Tucson metropolitan area.
- Many planning entities not taking the APA seriously, unaware of active mining or sources of construction materials.

ARPA amends APA in 2019 to improve General Plan compliance with the assistance of AZGS

- H2453 amends APA and GSA to include the identification of active mines in planning areas
- Passed unanimously in both House and Senate
- Makes it more difficult to use lack of mapping to ignore APA requirements
- AZGS compiled and maintains free database of active mines in AZ



Conclusion: Aggregate protection efforts can be highly effective if leveraged with STATEMAP program

- APA influenced policies and future development actions of:
 - The largest metropolitan area in Arizona
 - Four of the most populous cities in AZ (Phoenix, Surprise, Peoria and Glendale)
 - The fastest growing city in the United States (Phoenix)
- Aggregate Protection legislation can be accomplished by:
 - Leveraging existing legislation
 - Starting small and build incrementally
 - Using credible science to demonstrate needs and effectiveness
- AZGS can be a trusted partner
 - Independent
 - Agile and responsive
 - Credible, convincing and highly-regarded science

For more information, contact:



Eric J. Mears, R.G.

Mining Market Segment Leader

EMears@haleyaldrich.com

Haley & Aldrich, Inc.

- Over 25 years of mine permitting and entitlement experience
- Served on City of Phoenix Village Planning Commission for 7 years
- Industry member of AZGS Geologic Mapping Advisory Commission since 2011
- Advanced education and training in community relations, media training and social license