

**STAFF REPORT
INFORMATIONAL
109**

A Statewide

04/19/18

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**STATUS REPORT ON THE REMEDIATION OF ABANDONED MINE FEATURES
LOCATED ON STATE SCHOOL LANDS UNDER THE COMMISSION'S
JURISDICTION**

INTRODUCTION:

The purpose of this Staff Report is to inform the Commission and the public about the status of the Abandoned Mine Remediation and Monitoring Program on State school lands. The Staff Report addresses the program's needs, important milestones, and accomplishments.

BACKGROUND:

Commission staff conducts periodic field surveys associated with the issuance and management of mineral prospecting permits and leases in California. While conducting these surveys, staff has observed numerous abandoned mine features that could pose a hazard to the public and wildlife. The historic mining in California that resulted in today's abandoned mine lands (AML) began before many of these lands were conveyed to the Commission under the federal School Lands Act (Ch. 145, 10 Stat. 244), which also pre-dates the State's Surface Mining and Reclamation Act of 1975 (Cal. Pub. Resource Code §§ 2710-2796) administered by the California Department of Conservation (DOC). The Commission's AML remediation program originated in 2002 when the Commission began to actively seek out dangerous mine features for remediation. The subsequent development of the Commission's AML program is a direct result of these past observations in conjunction with the directives and goals of the DOC's Division of Mine Reclamation (DMR; formerly the Office of Mine Reclamation [OMR]), whose primary function is to address these concerns.

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IMPORTANT MILESTONES:

DATE	RESULTING ACTIONS
1997: DOC conducts a 3-year analysis of abandoned mine features in CA.	AML Unit established at the DOC.
2000: OMR's Abandoned Mine Lands Unit analysis completed.	Using a sampling of 5 percent of the State, >40,000 mine features discovered.
2002: OMR contacts the Commission to inquire about the need for abandoned mine remediation on lands managed by the Commission.	Commission accepts funding from OMR to remediate mine features at three sites (Item C62, December 16, 2002) .
2003: The Commission approves the remediation of the Pacific Fluorite and Scout's Cove mines using the funding provided by OMR. A Memorandum of Understanding (MOU) is established between the Commission and OMR.	A cupola and foam plug were installed (respectively) at the two mine sites (Item C50, February 21, 2003) .
2004: OMR obtains permanent funding source from gold and silver produced in California for Abandoned Mine Reclamation and Minerals Fund	New Legislation, Cal. Pub. Resource Code §§ 2207 (d)(4)(B)(i)
2009: The DOC releases a comprehensive inventory of mine features on State lands that is ranked by hazard potential.	Utilizing a GIS dataset of State school lands, the DOC reported that 143 school land parcels possessed one or more mine features.
2014: The Commission completes the final GIS dataset of State school lands that is then submitted to OMR for reanalysis.	OMR utilizes the updated GIS dataset to refine the number of school land parcels with mine features to 100.
2016: The Commission approves the adoption of a new, 7-year MOU with the OMR to remediate mine features on State lands.	Commission and DMR staff are actively engaged in the inventory, inspection, remediation, and contracts associated with the AML program (Item C74, February 9, 2016) .

As a result of this successful collaboration, DMR and Commission staff have worked together and have developed a comprehensive process for determining the most appropriate remediation approach. This process is included in Exhibit A, attached.

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DISCUSSION:

Inspection & Remediation

Addressing physical hazards associated with abandoned mines can be a complex process. The goal is to limit the potential harm to the public from entering old and potentially unsafe abandoned mine structures and to protect the biological resources of the mines, such as owls and bat colonies. Solutions range from simple installation of warning signs to permanent closures that are determined on a case-by-case basis depending on the severity of the public hazard. If staff determines that a mine feature is sufficiently hazardous to warrant a permanent closure, the site is then surveyed for the mine feature's biological, historical, and physical characteristics, to determine, in consultation with the California Department of Fish and Wildlife and Department of Parks and Recreation, which closure technique is the most appropriate. In the past, biological surveys that yielded no observations of active bat usage of a shaft were identified as possible candidates for remediation by backfilling the mine opening with waste rock. More recently, staff have suspended remediation by backfilling in favor of other closure methods. At this time, staff is only approving the installation of semi-permanent closure structures that can allow access for future surveys. Other closure solutions include the installation of a polyurethane foam plug, cable netting, and culvert gates. Each of these closure methods are prescribed only under certain conditions that warrant the use of that specific type of closure. In other cases where staff observes shallower shafts that may not warrant the construction of a cupola, a non-barbed wire fence is constructed around the shaft, either as a permanent, or interim protection measure. In other more extreme cases, when a mine site is in a remote area, a helicopter may be needed to ferry in the necessary equipment for closure construction.

Common Abandoned Mine Features:

- **Adit:** Horizontal openings into an underground mine. Adits are usually large enough for a person to walk through but tend to be narrow. The primary hazard within an adit is the fall hazard due to the presence of a winze (underground shaft), collapse of the adit itself, poisonous gases, water, dangerous animals or old explosives. Adits are commonly remediated with the installation of a bat gate that could include a tortoise entryway, if needed, based on internal survey findings.
- **Shaft:** Vertical, or near-vertical holes in the ground. These features can be hundreds of feet in depth and can have a small or large footprint. The primary hazard associated with a shaft is the fall hazard, particularly because many of these shafts are not easily

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visible from a distance. The outer rim of the shaft, called the collar, could also be unstable under the weight of a person, increasing the possibility of a fall. Shafts are commonly remediated with the construction of a cupola, which is a steel, box-shaped structure built over the shaft to allow entry by bats and owls, while restricting access by the public.

- **Tailings pile:** Mine tailings often contain elevated concentrations of heavy metals associated with the ore such as lead, zinc, copper, arsenic or cyanide. These metals may impact human or other biologic receptors depending on the location, visitation, and other attributes. Remediation methods may include tailings removal, or isolation by soil capping.
- **Open stope/trench:** Open trenches can form as the result of surface weathering of underground stoped (or steplike) areas. These are usually planar portions of the underground mine where the ore has been removed for processing, leaving behind empty cavities within the native rock that are usually interconnected with the main mining area. These cavities could exhibit surface expressions as they continuously erode over time and can become a fall hazard. Stopes and trenches are usually large, linear/planar cavities that can cover large geographic areas. Therefore, remediation methods would vary greatly from site-to-site, but most of these features are either fenced or backfilled due to their irregular shapes and sizes.
- **Mine waste:** Mine waste is either overburden rock or rock remaining after the segregation of the ore. It is often characterized as a sloping pile of irregular waste rock that has been excavated from a mine. The hazard associated with rock waste piles would be a slip/fall hazard. Since the hazard level is minimal, and mine waste is considered a historic element of the mine, mine waste piles do not typically require remediation.
- **Building foundations:** The remnants of building foundations and other mine structures can often be observed near a mine site. These foundations and structures can include older processing equipment and sites that may contain chemical hazards. Any obviously dangerous features that are observed are clearly signed. In one instance, an ore chute was stabilized from physical collapse to protect the public and preserve the historic value.

CONCLUSION AND FUTURE ACTIONS:

So far, out of the 100 State school land parcels containing one or more abandoned mine features, remediation has been completed on 53 parcels. Of the remaining 47 parcels, six parcels are partially remediated, 35 parcels require a

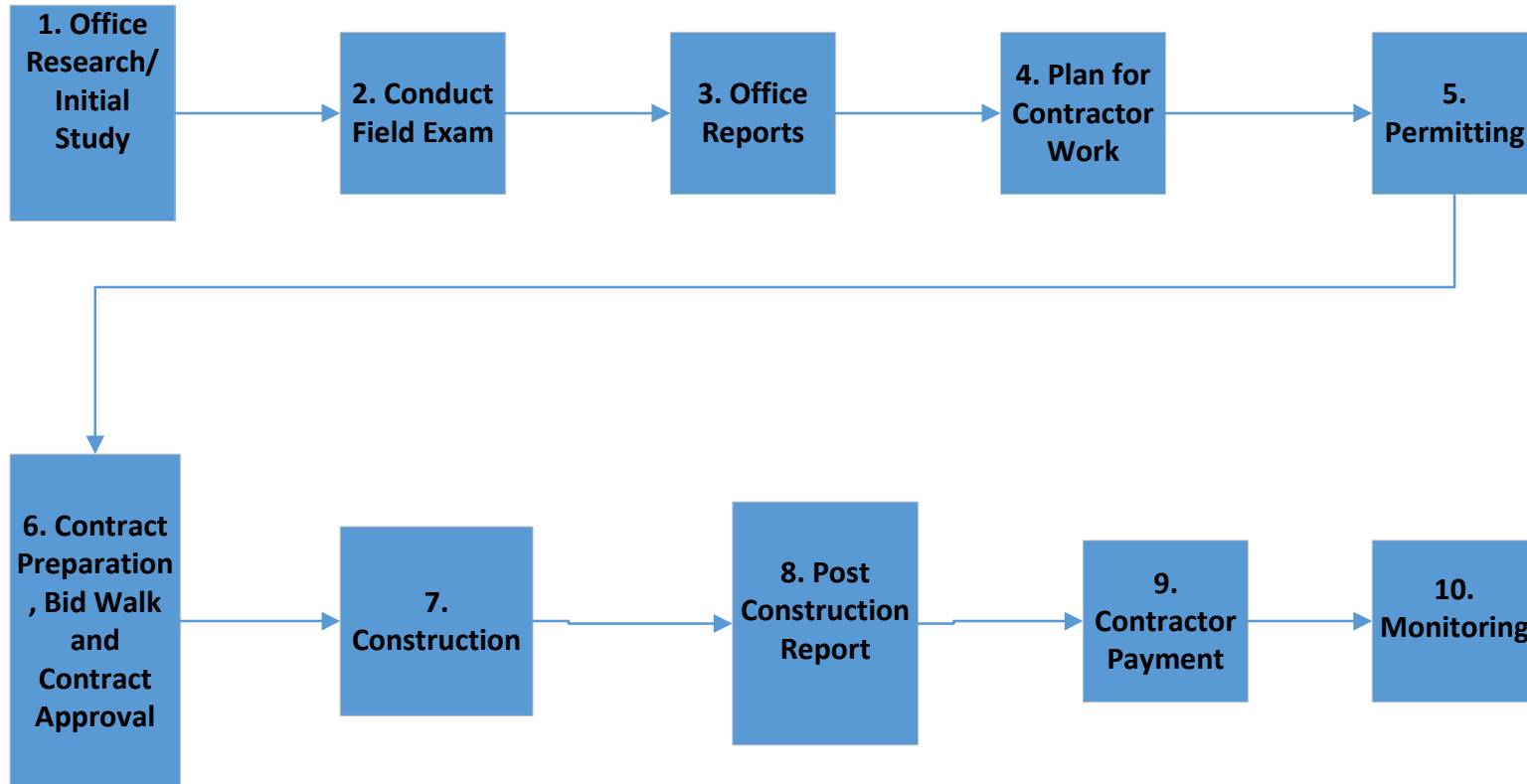
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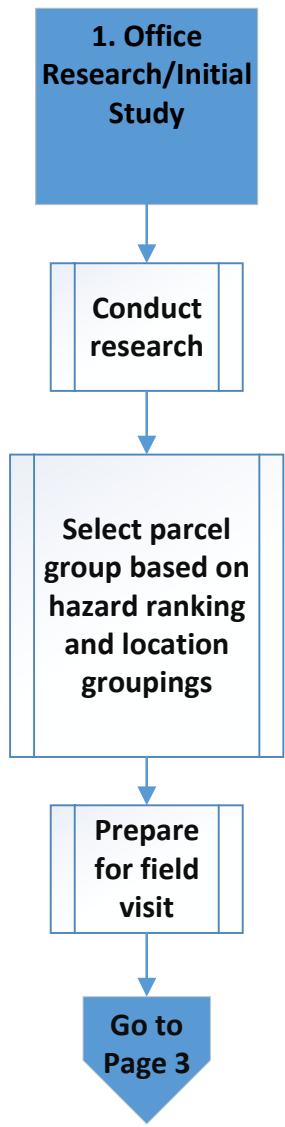
field exam to determine the most appropriate remediation solution, and six parcels contain some form of chemical contamination requiring additional evaluation. A summary of these accomplishments is included in Exhibit B. These contaminated mines may require more complex remediation actions in the future in addition to the warning signs that have been already posted. As time permits, staff inspects existing mine closures to ensure that vandalism and weathering have not compromised their integrity. In fact, closures on State school lands have been vandalized and it is common to discover that many warning signs have been damaged by shooting or theft. For example, the bat gate at the Crown Uranium Mine and the cupola at the Pacific Fluorite Mine were both vandalized by having their steel bars cut, both of which had to be repaired by a contractor. Staff replaces warning signs when they are discovered missing. It is estimated that primary mine remediations of the most hazardous features should be completed within a decade. Following this milestone, the AML remediation program will transition into an inspection and monitoring program that will ensure that these closures are not compromised, to ensure continued protection of the public.

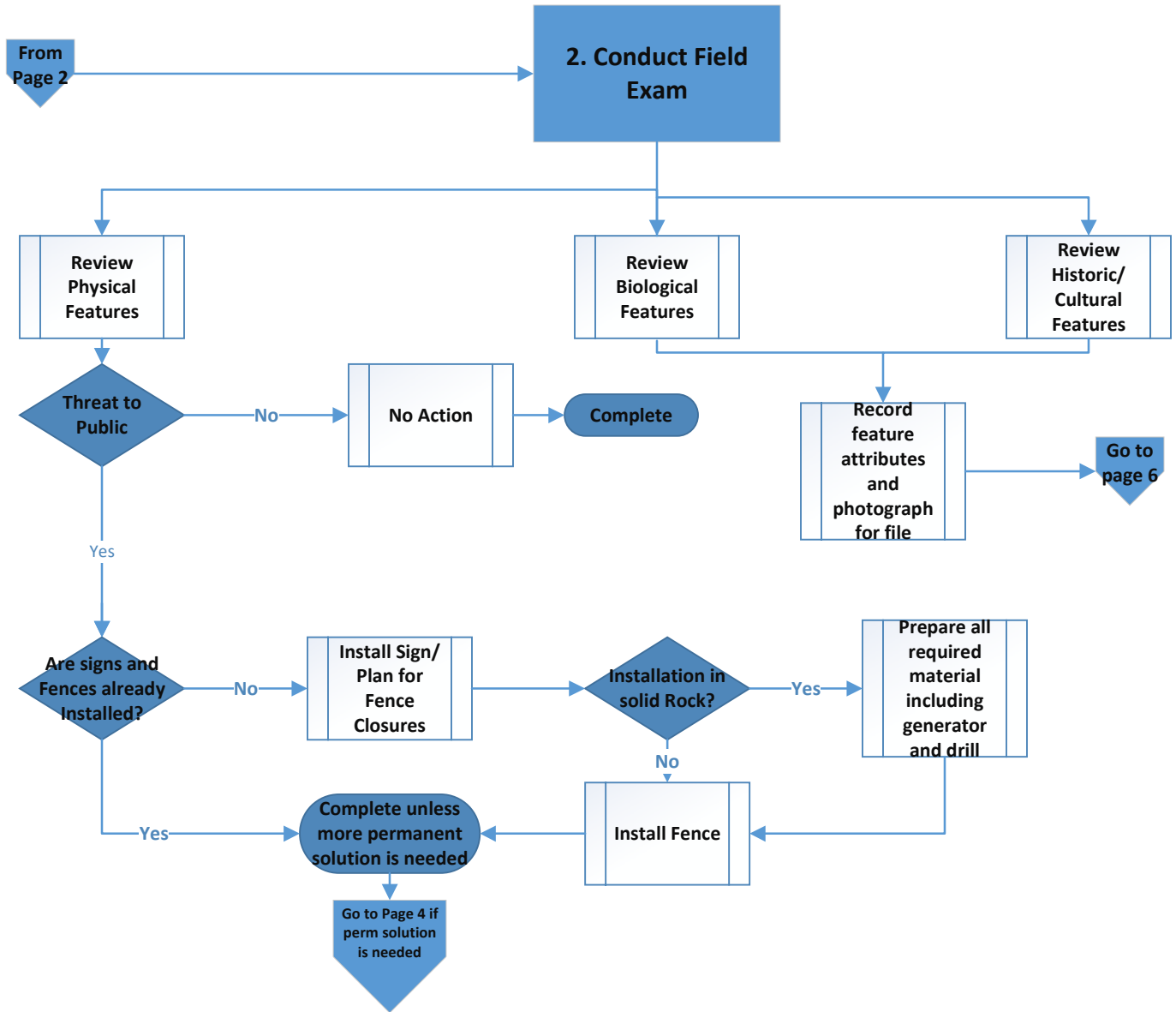
EXHIBITS:

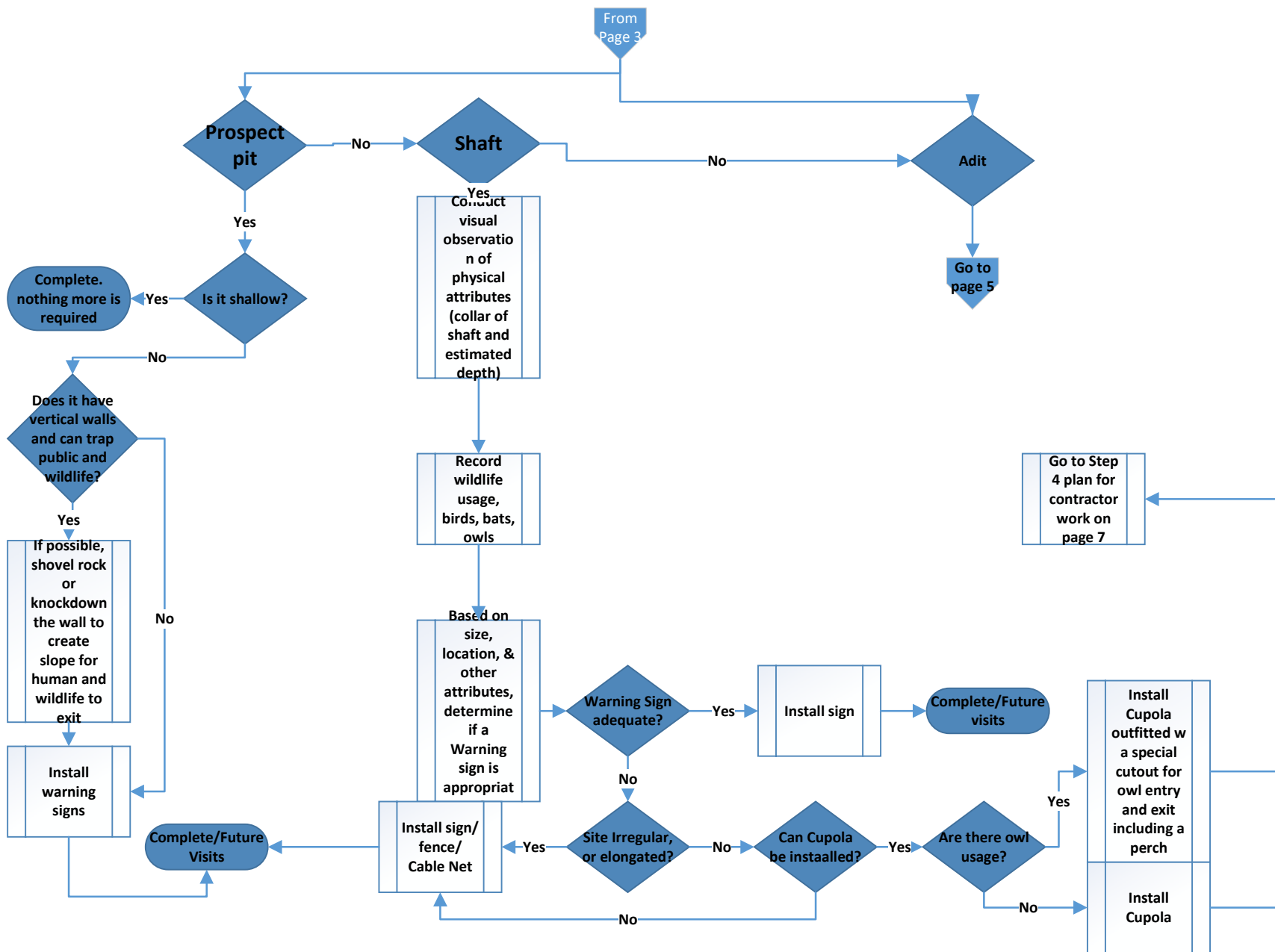
- A. Major Steps in Abandoned Mine Identification and Remediation
- B. AML Accomplishments Summary

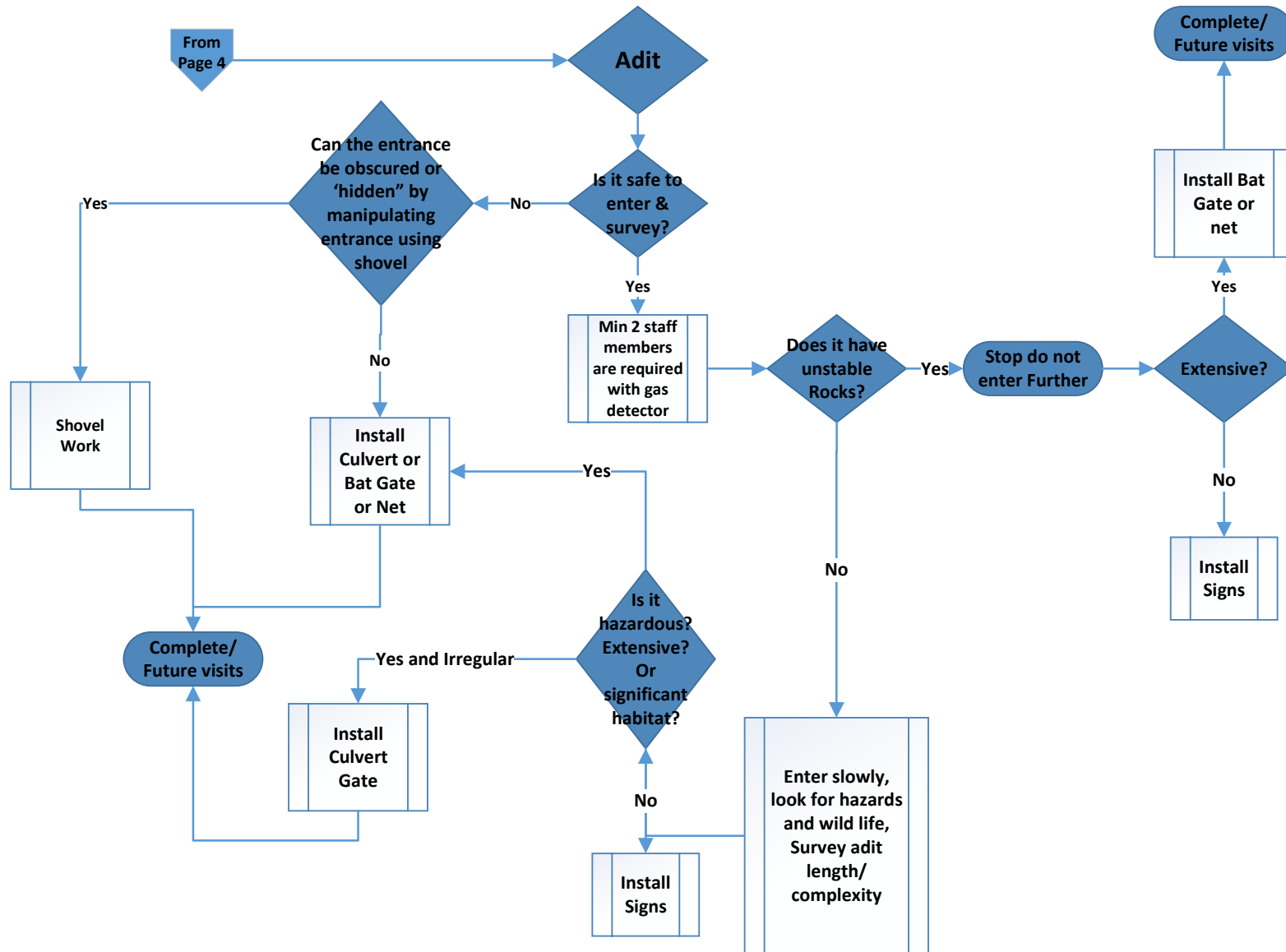
Major Steps in Identification and Remediation Process of CA Abandoned Mines on State School Lands

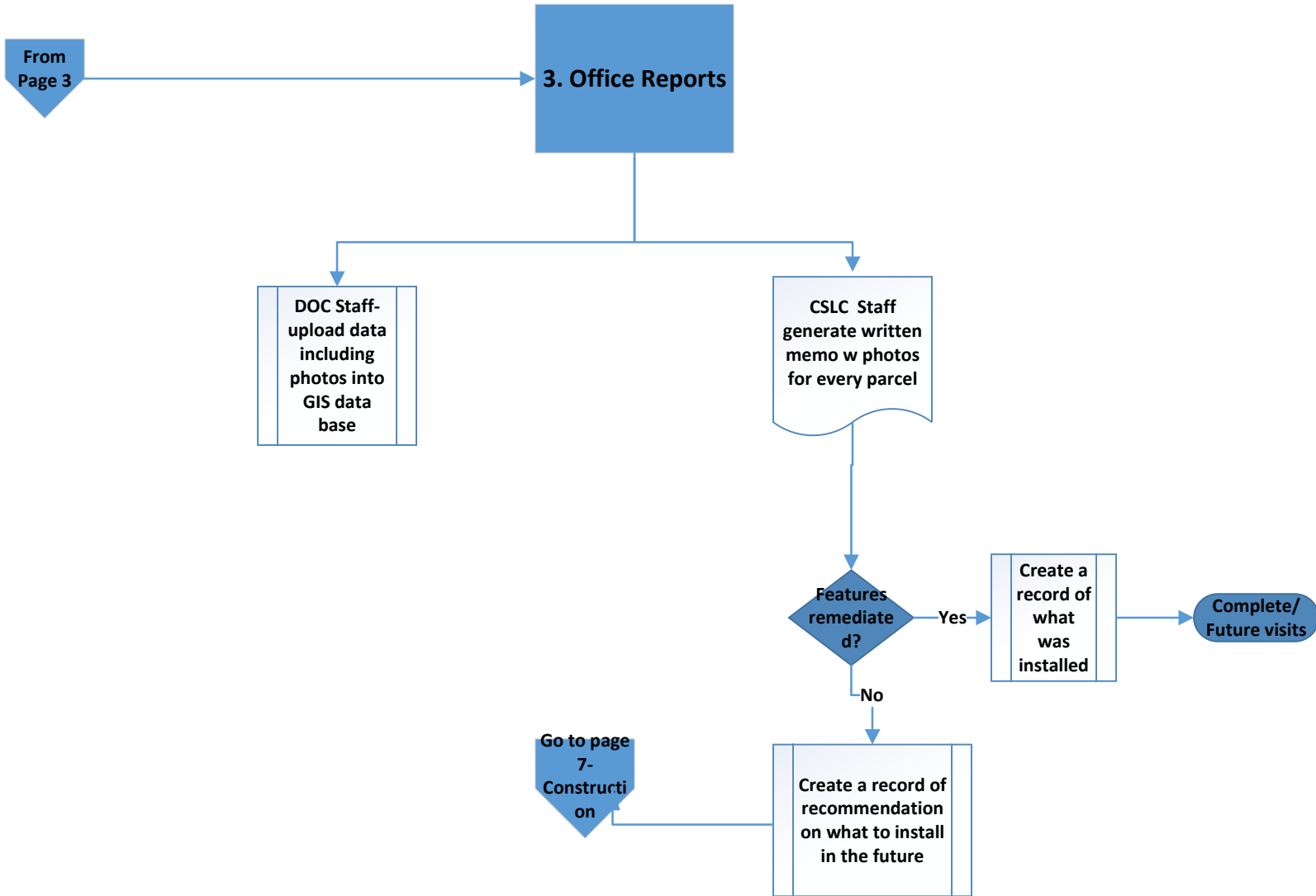


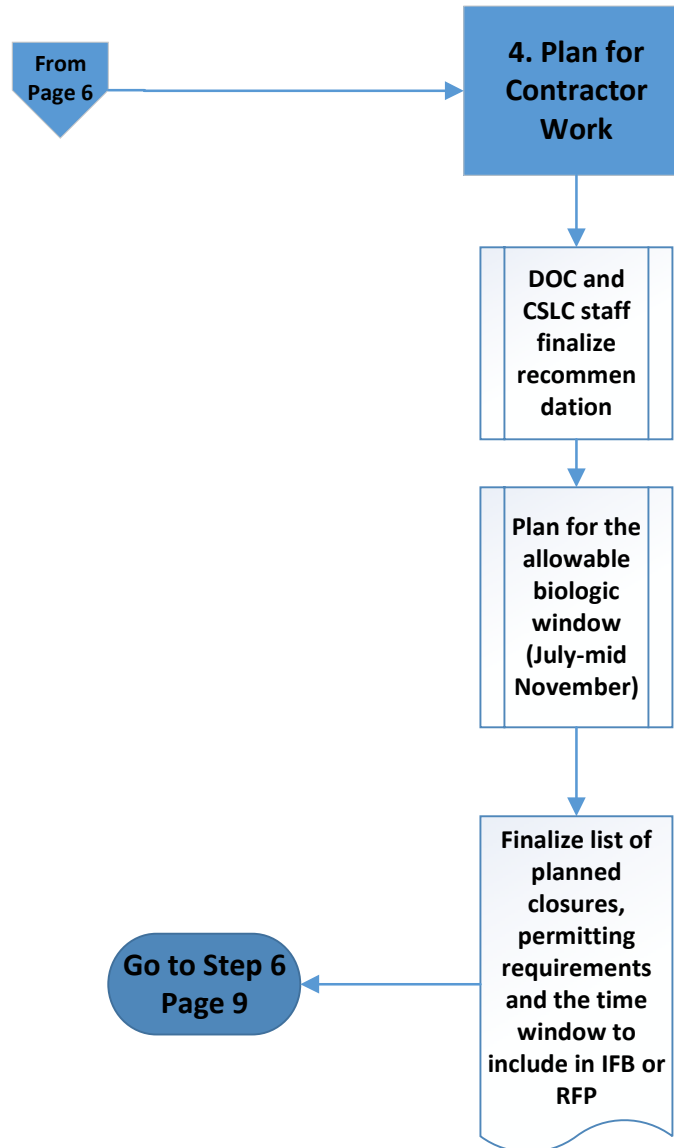


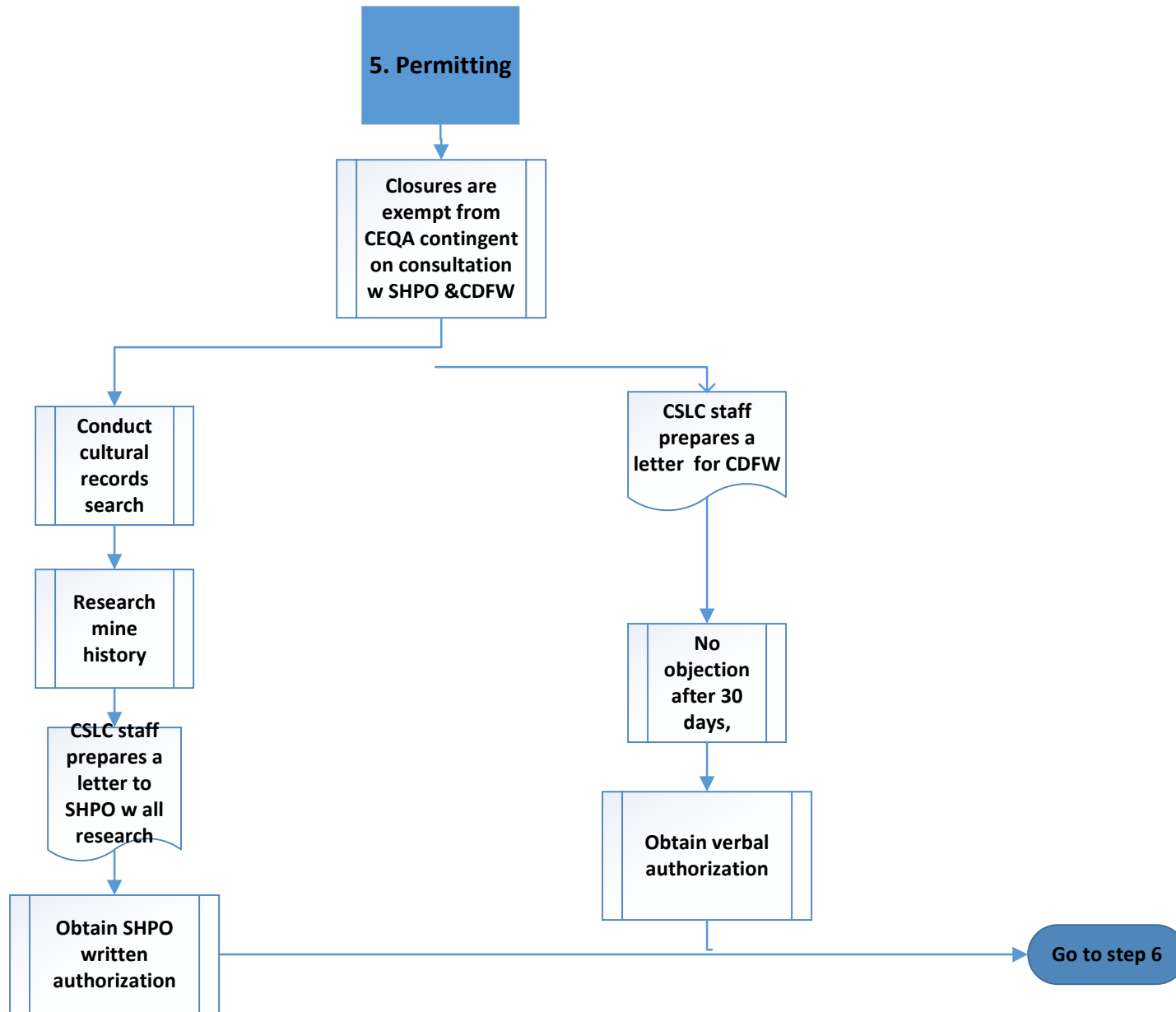












**6. Contract Preparation,
Bid Walk and Contract
Approval**

DOC prepares
an IFB or RFP
for
competitive
bid

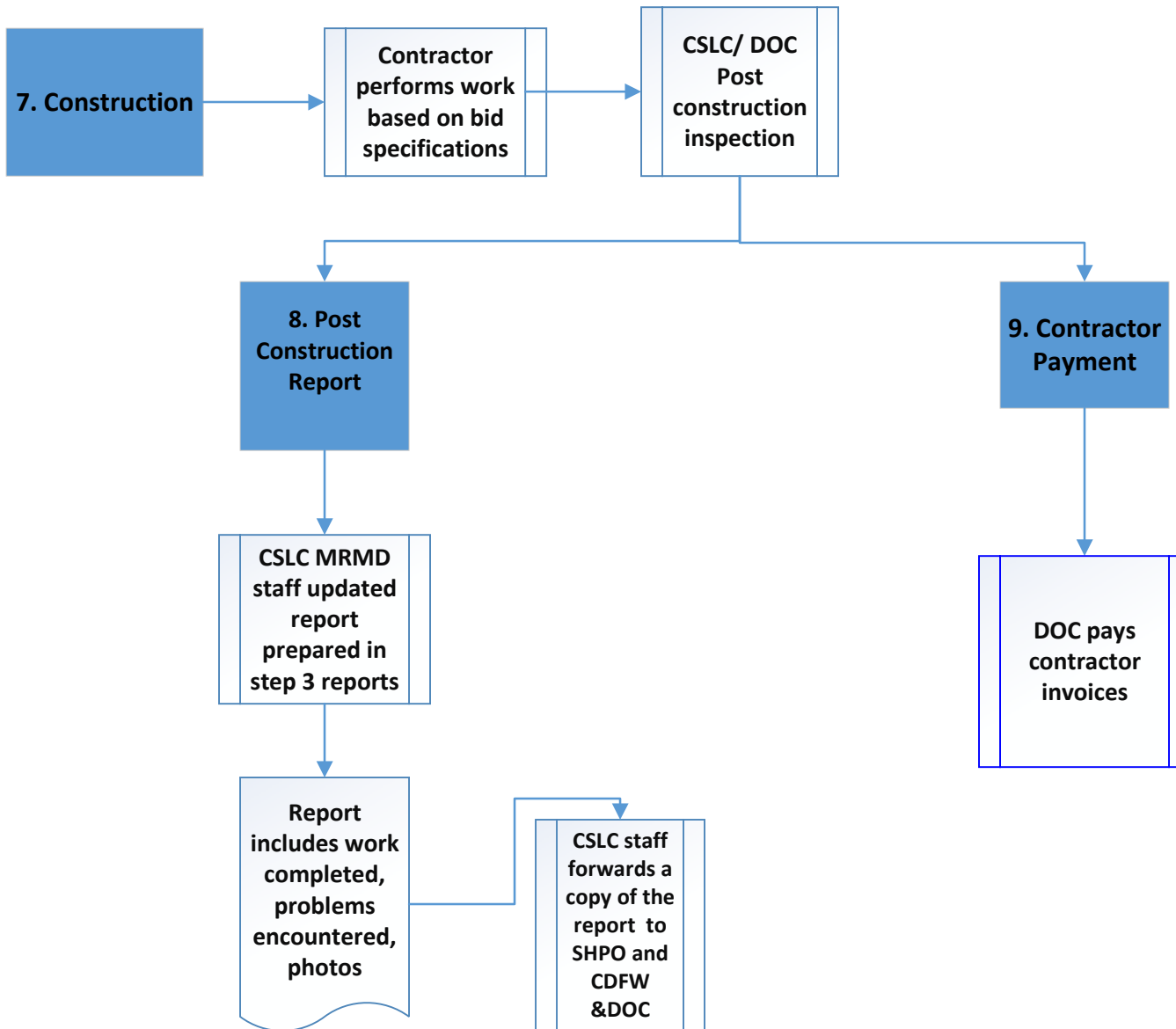
Conduct bid
walk with
contractor

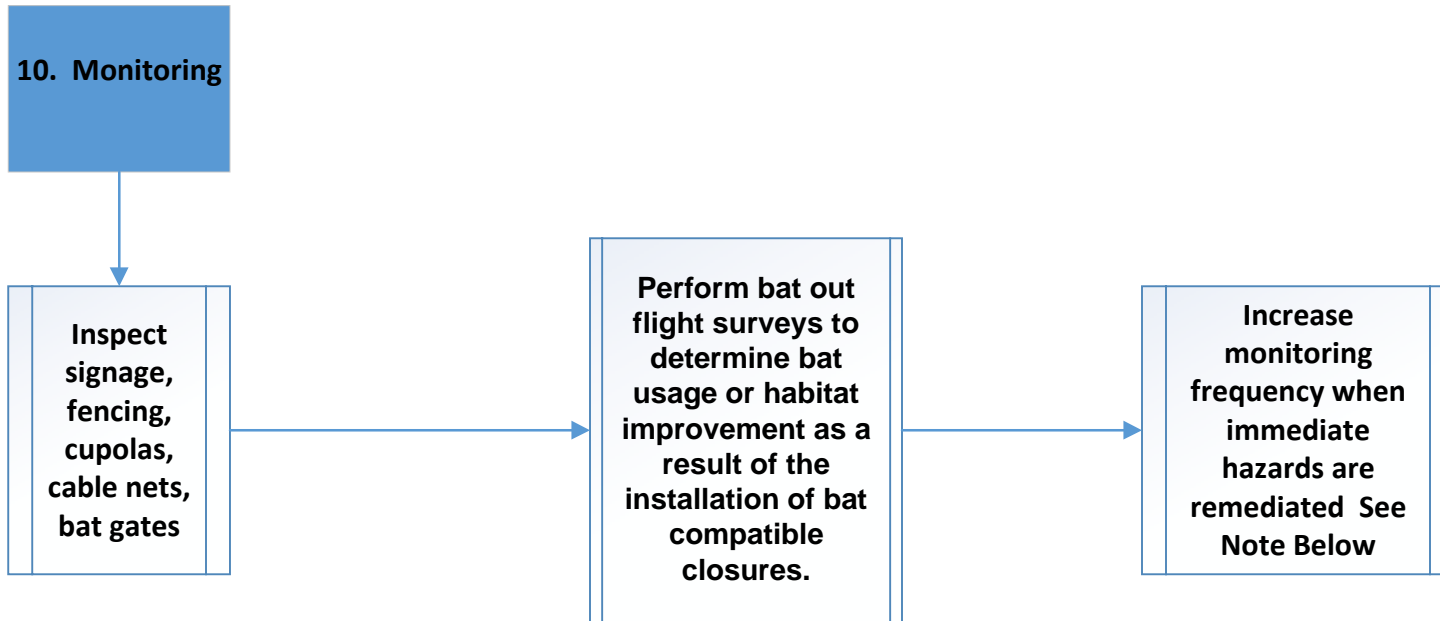
Solicit bids

Select
contractor

Approval by
Dept. of
General
Services

Contract is
issued



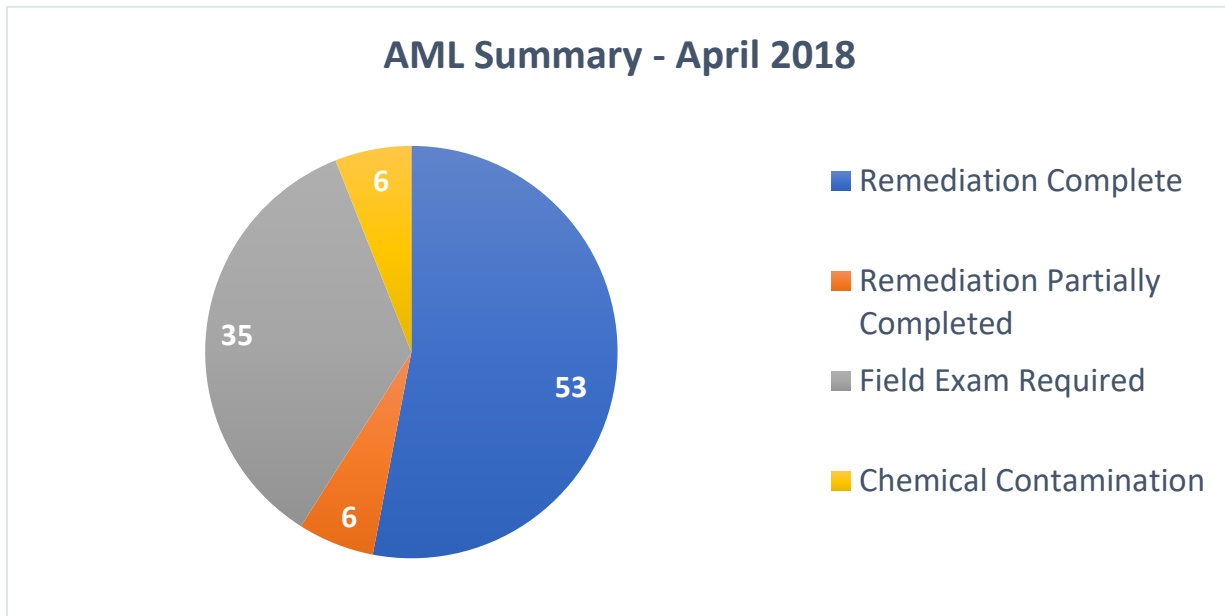


Note:

- Every 5 Years for remotely located AML parcels.
- Every 2 years for easily reachable parcels

EXHIBIT B

W 40102



REMEDIATION ACTION	TOTAL
Warning Signs	>154
Wire Fences	36
Backfills	26
Bat Gates	13
Cupolas	12
Foam Plugs	5
Cable Nets	4