



BENEFITS OF USING DRONES FOR DESIGN, CONSTRUCTION MANAGEMENT, AND OPERATION OF OILFIELD WATER INFRASTRUCTURE

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DRONE APPLICATIONS

- Applications: Drones provide a level of detail and efficiency that would otherwise be unmatched
- Rules and Regulations: Commercial Drone Pilot Certification Part 107 - Small Unmanned Aircraft
- Field applications:
 - Site Assessments & Area of Reviews
 - Existing infrastructure, WOUS, & Wetlands
 - Construction Oversight & Field Operations
 - Safety Management & Maintenance



RULES AND REGULATIONS

- Commercial drone pilots are licensed by the Federal Aviation Administration under Part 107: Small Unmanned Aircraft Regulation
- Basic Rules of flight:
 - Must complete the FAA Remote Pilot Certification Exam
 - Must register the unmanned aircraft and have registration markings visible
 - Allowed to fly in Class G Airspace (0-1,200')



RULES OF FLIGHT

- Must communicate operations with local airports when communication towers are manned
- Permitted to fly 400' above surface level & less than 100 mph
- Must maintain visual line of sight
- Only permitted to fly over people directly involved in drone operations
- Limited to daylight operations without an exemption
- Drone must weigh less than 55 lbs.
- Must renew Remote Pilot certification every 2 years



SITE ASSESSMENT & AREA OF REVIEWS

- Site mapping/Aerial pictures
 - Drones provide an inexpensive way to gather detailed information about a site that was previously unavailable
 - No Helicopter needed
- Increase mapping detail, and elimination of possible errors during a site evaluation
 - Existing Infrastructure
 - Water wells
 - Pipelines
 - Steams & Wetlands



SITE ASSESSMENT & AREA OF REVIEWS

- Drones provide an increased access to site:
 - Provide the ability to assess areas that would be difficult, or impossible, for a worker to access.
 - (Ex. Neighboring properties, impassible wetland areas, rivers, swamps, brush, elevated surfaces.)
- An increase in access during a site assessment leads to a more thorough understanding of the site allowing the operator to eliminate unforeseen issues.



CONSTRUCTION OVERSIGHT & FIELD OPERATIONS

- Ability to better convey how a construction project is progressing
 - Allows for better management of resources
- Allows for constant oversight without interrupting operations
 - Heavy machinery; multiple moving parts
- Ability to monitor sites quickly allowing limited personnel to monitor multiple sites
 - Multiple, or large sites
 - Stretches of pipeline installation



CONSTRUCTION OVERSIGHT & FIELD OPERATIONS

- Ability to access damage, or repairs, of possibly dangerous areas before introducing a worker into the situation
 - Elevated surfaces on drilling rigs, or tank batteries
 - Confined spaces
 - Near rivers, or impoundments



SAFETY MANAGEMENT & MAINTENANCE

- Provide an simpler, inexpensive, way to conduct maintenance inspections of water infrastructure: (Impoundments, Tank batteries, containments)
 - Weathered, or warping, berms
 - Weather damage to pits, or other infrastructure equipment
- Decrease safety risks for oversight & construction personnel while on the job site
 - Ability to remove the human element from a potential dangerous situation.
 - Tank Batteries



SUMMARY

- Unmatched level of detail and efficiency
- Commercial Drone Pilot Certification: Small Unmanned Aircraft (Drone) - Part 107
- Site Assessment
 - Existing infrastructure, WOUS, & Wetlands
 - Safely monitor & provide detailed description of project status
- Construction Oversight & Field Operations
- Safety Management & Maintenance





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