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(12) **United States Patent**  
**Haddy**

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(54) **DETECTION OF INCURSION OF PROPOSED EXCAVATION ZONES INTO BURIED ASSETS**

USPC ..... 702/130; 705/7, 11; 340/686.6, 8.1;  
707/104.1  
See application file for complete search history.

(71) Applicant: **Alan Haddy**, Naples, FL (US)

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(72) Inventor: **Alan Haddy**, Naples, FL (US)

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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This patent is subject to a terminal disclaimer.

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*Primary Examiner* — Steven Lim

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*Assistant Examiner* — Kaleria Knox

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(74) *Attorney, Agent, or Firm* — Mark Terry

**Related U.S. Application Data**

(57) **ABSTRACT**

(63) Continuation-in-part of application No. 13/745,846, filed on Jan. 20, 2013, which is a continuation of application No. 13/543,612, filed on Jul. 6, 2012, now Pat. No. 8,358,201.

A method on a computing device for defining a buffer zone around a buried asset at an above-surface location is provided that solves the above-described problems. The method includes receiving and storing buried asset data points, wherein each buried asset data point comprises a geographical coordinate and a precision data value corresponding to the geographical coordinate, for a buried asset, wherein the buried asset data points correspond to signals that were detected and read from the buried asset at the above-surface location. The method further includes generating a first data structure that represents a two dimensional area comprising a buffer zone at the above-surface location, wherein the first data structure is generated by defining an area around each geographical coordinate, wherein a size of each area is based on the precision data values of the buried asset data points.

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**G08C 17/02** (2006.01)

(52) **U.S. Cl.**  
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USPC ..... **340/8.1; 702/130**

(58) **Field of Classification Search**  
CPC ..... G06F 15/00; G06Q 10/00

**20 Claims, 13 Drawing Sheets**

