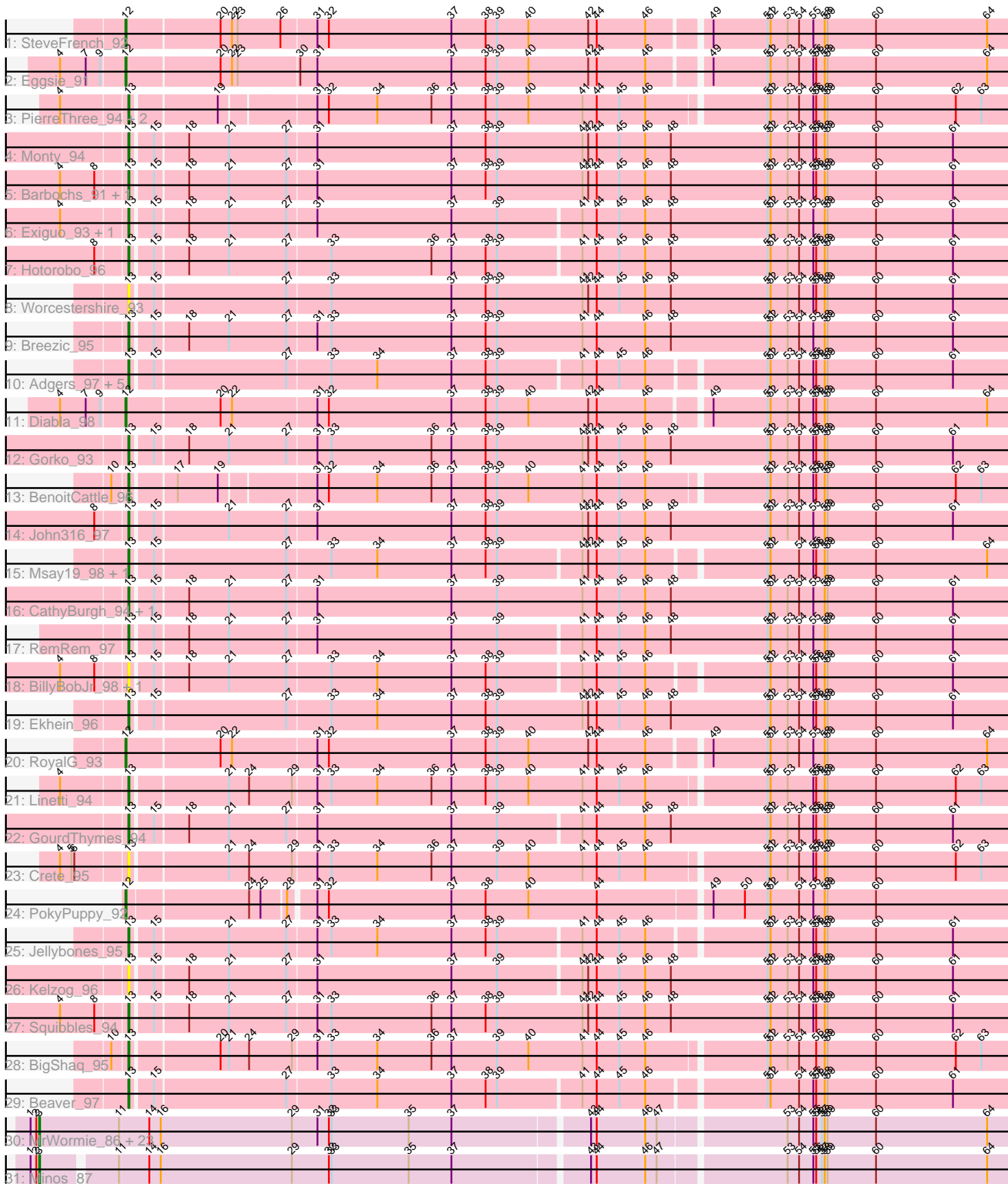


Pham 294717



Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly with annotated starts, the track will be further scaled to only show that region of the ORF with annotated starts. This action will be indicated by adding "Zoomed" to the title. For starts, yellow indicates the location of called starts comprised solely of Glimmer/GeneMark auto-annotations, green indicates the location of called starts with at least 1 manual gene annotation.

## Pham 294717 Report

This analysis was run 04/18/26 on database version 643.

Pham number 294717 has 66 members, 5 are drafts.

Phages represented in each track:

- Track 1 : SteveFrench\_92
- Track 2 : Eggsie\_91
- Track 3 : PierreThree\_94, Dakiti\_96, Chelms\_94
- Track 4 : Monty\_94
- Track 5 : Barbochs\_91, Flakey\_95
- Track 6 : Exiguo\_93, Sam12\_93
- Track 7 : Hotorobo\_96
- Track 8 : Worcestershire\_93
- Track 9 : Breezic\_95
- Track 10 : Adgers\_97, BirksAndSocks\_97, FelixAlejandro\_97, Boneham\_96, Sombrero\_95, Butterball\_95
- Track 11 : Diabla\_98
- Track 12 : Gorko\_93
- Track 13 : BenoitCattle\_96
- Track 14 : John316\_97
- Track 15 : Msay19\_98, Poland\_98
- Track 16 : CathyBurgh\_94, Lizzo\_94
- Track 17 : RemRem\_97
- Track 18 : BillyBobJr\_98, CinnamonToast\_98
- Track 19 : Ekhein\_96
- Track 20 : RoyalG\_93
- Track 21 : Linetti\_94
- Track 22 : GourdThymes\_94
- Track 23 : Crete\_95
- Track 24 : PokyPuppy\_92
- Track 25 : Jellybones\_95
- Track 26 : Kelzog\_96
- Track 27 : Squibbles\_94
- Track 28 : BigShaq\_95
- Track 29 : Beaver\_97
- Track 30 : MrWormie\_86, Jormungandr\_85, Jams\_86, Harambe\_85, Charianelly\_86, Guillaume\_85, Luker\_87, Anamika\_85, Woes\_85, Damp\_86, Shelley\_86, Nimi13\_85, Hail2Pitt\_84, Bianmat\_86, GalacticEye\_86, Hello\_85, Neevie\_85, Berries\_86, Sticker17\_86, Teal\_85, Lahirium\_86, Kaseim\_86, Newt\_87, Lidong\_86
- Track 31 : Minos\_87

### **Summary of Final Annotations (See graph section above for start numbers):**

The start number called the most often in the published annotations is 13, it was called in 31 of the 61 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Adgers\_97, Barbochs\_91, Beaver\_97, BenoitCattle\_96, BigShaq\_95, BillyBobJr\_98, BirksAndSocks\_97, Boneham\_96, Breezic\_95, Butterball\_95, CathyBurgh\_94, Chelms\_94, CinnamonToast\_98, Crete\_95, Dakiti\_96, Ekhein\_96, Exiguo\_93, FelixAlejandro\_97, Flakey\_95, Gorko\_93, GourdThymes\_94, Hotorobo\_96, Jellybones\_95, John316\_97, Kelzog\_96, Linetti\_94, Lizzo\_94, Monty\_94, Msay19\_98, PierreThree\_94, Poland\_98, RemRem\_97, Sam12\_93, Sombrero\_95, Squibbles\_94, Worcestershire\_93,

Genes that have the "Most Annotated" start but do not call it:

- 

Genes that do not have the "Most Annotated" start:

- Anamika\_85, Berries\_86, Bianmat\_86, Charianelly\_86, Damp\_86, Diabla\_98, Eggsie\_91, GalacticEye\_86, Guillaume\_85, Hail2Pitt\_84, Harambe\_85, Hello\_85, Jams\_86, Jormungandr\_85, Kaseim\_86, Lahirium\_86, Lidong\_86, Luker\_87, Minos\_87, MrWormie\_86, Neoevie\_85, Newt\_87, Nimi13\_85, PokyPuppy\_92, RoyalG\_93, Shelley\_86, SteveFrench\_92, Sticker17\_86, Teal\_85, Woes\_85,

### **Summary by start number:**

Start 3:

- Found in 25 of 66 ( 37.9% ) of genes in pham
- Manual Annotations of this start: 25 of 61
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Anamika\_85 (CS3), Berries\_86 (CS3), Bianmat\_86 (CS3), Charianelly\_86 (CS3), Damp\_86 (CS3), GalacticEye\_86 (CS3), Guillaume\_85 (CS3), Hail2Pitt\_84 (CS3), Harambe\_85 (CS3), Hello\_85 (CS3), Jams\_86 (CS3), Jormungandr\_85 (CS3), Kaseim\_86 (CS3), Lahirium\_86 (CS3), Lidong\_86 (CS3), Luker\_87 (CS3), Minos\_87 (CS3), MrWormie\_86 (CS3), Neoevie\_85 (CS3), Newt\_87 (CS3), Nimi13\_85 (CS3), Shelley\_86 (CS3), Sticker17\_86 (CS3), Teal\_85 (CS3), Woes\_85 (CS3),

Start 12:

- Found in 5 of 66 ( 7.6% ) of genes in pham
- Manual Annotations of this start: 5 of 61
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Diabla\_98 (CS2), Eggsie\_91 (CS2), PokyPuppy\_92 (CS2), RoyalG\_93 (CS2), SteveFrench\_92 (CS2),

Start 13:

- Found in 36 of 66 ( 54.5% ) of genes in pham
- Manual Annotations of this start: 31 of 61
- Called 100.0% of time when present

• Phage (with cluster) where this start called: Adgers\_97 (CS2), Barbochs\_91 (CS2), Beaver\_97 (CS2), BenoitCattle\_96 (CS2), BigShaq\_95 (CS2), BillyBobJr\_98 (CS2), BirksAndSocks\_97 (CS2), Boneham\_96 (CS2), Breezic\_95 (CS2), Butterball\_95 (CS2), CathyBurgh\_94 (CS2), Chelms\_94 (CS2), CinnamonToast\_98 (CS2), Crete\_95 (CS2), Dakiti\_96 (CS2), Ekhein\_96 (CS2), Exiguo\_93 (CS2), FelixAlejandro\_97 (CS2), Flakey\_95 (CS2), Gorko\_93 (CS2), GourdThymes\_94 (CS2), Hotorobo\_96 (CS2), Jellybones\_95 (CS2), John316\_97 (CS2), Kelzog\_96 (CS2), Linetti\_94 (CS2), Lizzo\_94 (CS2), Monty\_94 (CS2), Msay19\_98 (CS2), PierreThree\_94 (CS2), Poland\_98 (CS2), RemRem\_97 (CS2), Sam12\_93 (CS2), Sombrero\_95 (CS2), Squibbles\_94 (CS2), Worcestershire\_93 (CS2),

### **Summary by clusters:**

There are 2 clusters represented in this pham: CS3, CS2,

Info for manual annotations of cluster CS2:

- Start number 12 was manually annotated 5 times for cluster CS2.
- Start number 13 was manually annotated 31 times for cluster CS2.

Info for manual annotations of cluster CS3:

- Start number 3 was manually annotated 25 times for cluster CS3.

### **Gene Information:**

Gene: Adgers\_97 Start: 70250, Stop: 69354, Start Num: 13

Candidate Starts for Adgers\_97:

(Start: 13 @70250 has 31 MA's), (15, 70229), (27, 70094), (33, 70049), (34, 70001), (37, 69923), (38, 69887), (39, 69875), (41, 69791), (44, 69776), (45, 69752), (46, 69725), (51, 69611), (52, 69608), (53, 69590), (54, 69578), (55, 69563), (56, 69560), (58, 69551), (59, 69548), (60, 69497), (61, 69416),

Gene: Anamika\_85 Start: 68874, Stop: 67876, Start Num: 3

Candidate Starts for Anamika\_85:

(1, 68883), (2, 68877), (Start: 3 @68874 has 25 MA's), (11, 68790), (14, 68760), (16, 68748), (29, 68610), (31, 68583), (32, 68571), (33, 68568), (35, 68487), (37, 68442), (43, 68307), (44, 68301), (46, 68250), (47, 68238), (53, 68112), (54, 68100), (55, 68085), (56, 68082), (57, 68076), (58, 68073), (59, 68070), (60, 68019), (64, 67902),

Gene: Barbochs\_91 Start: 69441, Stop: 68524, Start Num: 13

Candidate Starts for Barbochs\_91:

(4, 69507), (8, 69471), (Start: 13 @69441 has 31 MA's), (15, 69420), (18, 69387), (21, 69345), (27, 69285), (31, 69255), (37, 69114), (38, 69078), (39, 69066), (41, 68976), (42, 68970), (44, 68961), (45, 68937), (46, 68910), (48, 68883), (51, 68781), (52, 68778), (53, 68760), (54, 68748), (55, 68733), (56, 68730), (58, 68721), (59, 68718), (60, 68667), (61, 68586),

Gene: Beaver\_97 Start: 71591, Stop: 70695, Start Num: 13

Candidate Starts for Beaver\_97:

(Start: 13 @71591 has 31 MA's), (15, 71570), (27, 71435), (33, 71390), (34, 71342), (37, 71264), (38, 71228), (39, 71216), (41, 71132), (44, 71117), (45, 71093), (46, 71066), (51, 70952), (52, 70949), (54, 70919), (55, 70904), (56, 70901), (58, 70892), (59, 70889), (60, 70838), (61, 70757),

Gene: BenoitCattle\_96 Start: 70989, Stop: 70093, Start Num: 13

Candidate Starts for BenoitCattle\_96:

(10, 71004), (Start: 13 @70989 has 31 MA's), (17, 70947), (19, 70905), (31, 70812), (32, 70800), (34, 70749), (36, 70692), (37, 70671), (38, 70635), (39, 70623), (40, 70590), (41, 70533), (44, 70518), (45, 70494), (46, 70467), (51, 70350), (52, 70347), (53, 70329), (54, 70317), (55, 70302), (56, 70299), (58, 70290), (59, 70287), (60, 70236), (62, 70152), (63, 70125),

Gene: Berries\_86 Start: 68846, Stop: 67848, Start Num: 3

Candidate Starts for Berries\_86:

(1, 68855), (2, 68849), (Start: 3 @68846 has 25 MA's), (11, 68762), (14, 68732), (16, 68720), (29, 68582), (31, 68555), (32, 68543), (33, 68540), (35, 68459), (37, 68414), (43, 68279), (44, 68273), (46, 68222), (47, 68210), (53, 68084), (54, 68072), (55, 68057), (56, 68054), (57, 68048), (58, 68045), (59, 68042), (60, 67991), (64, 67874),

Gene: Bianmat\_86 Start: 68886, Stop: 67888, Start Num: 3

Candidate Starts for Bianmat\_86:

(1, 68895), (2, 68889), (Start: 3 @68886 has 25 MA's), (11, 68802), (14, 68772), (16, 68760), (29, 68622), (31, 68595), (32, 68583), (33, 68580), (35, 68499), (37, 68454), (43, 68319), (44, 68313), (46, 68262), (47, 68250), (53, 68124), (54, 68112), (55, 68097), (56, 68094), (57, 68088), (58, 68085), (59, 68082), (60, 68031), (64, 67914),

Gene: BigShaq\_95 Start: 70588, Stop: 69683, Start Num: 13

Candidate Starts for BigShaq\_95:

(10, 70603), (Start: 13 @70588 has 31 MA's), (20, 70501), (21, 70492), (24, 70471), (29, 70426), (31, 70402), (33, 70387), (34, 70339), (36, 70282), (37, 70261), (39, 70213), (40, 70180), (41, 70123), (44, 70108), (45, 70084), (46, 70057), (51, 69940), (52, 69937), (53, 69919), (54, 69907), (56, 69889), (58, 69880), (59, 69877), (60, 69826), (62, 69742), (63, 69715),

Gene: BillyBobJr\_98 Start: 71698, Stop: 70802, Start Num: 13

Candidate Starts for BillyBobJr\_98:

(4, 71764), (8, 71728), (Start: 13 @71698 has 31 MA's), (15, 71677), (18, 71644), (21, 71602), (27, 71542), (33, 71497), (34, 71449), (37, 71371), (38, 71335), (39, 71323), (41, 71239), (44, 71224), (45, 71200), (46, 71173), (51, 71059), (52, 71056), (53, 71038), (54, 71026), (55, 71011), (56, 71008), (58, 70999), (59, 70996), (60, 70945), (61, 70864),

Gene: BirksAndSocks\_97 Start: 71205, Stop: 70309, Start Num: 13

Candidate Starts for BirksAndSocks\_97:

(Start: 13 @71205 has 31 MA's), (15, 71184), (27, 71049), (33, 71004), (34, 70956), (37, 70878), (38, 70842), (39, 70830), (41, 70746), (44, 70731), (45, 70707), (46, 70680), (51, 70566), (52, 70563), (53, 70545), (54, 70533), (55, 70518), (56, 70515), (58, 70506), (59, 70503), (60, 70452), (61, 70371),

Gene: Boneham\_96 Start: 71130, Stop: 70234, Start Num: 13

Candidate Starts for Boneham\_96:

(Start: 13 @71130 has 31 MA's), (15, 71109), (27, 70974), (33, 70929), (34, 70881), (37, 70803), (38, 70767), (39, 70755), (41, 70671), (44, 70656), (45, 70632), (46, 70605), (51, 70491), (52, 70488), (53, 70470), (54, 70458), (55, 70443), (56, 70440), (58, 70431), (59, 70428), (60, 70377), (61, 70296),

Gene: Breezic\_95 Start: 70142, Stop: 69225, Start Num: 13

Candidate Starts for Breezic\_95:

(Start: 13 @70142 has 31 MA's), (15, 70121), (18, 70088), (21, 70046), (27, 69986), (31, 69956), (33, 69941), (37, 69815), (38, 69779), (39, 69767), (41, 69677), (44, 69662), (46, 69611), (48, 69584), (51, 69482), (52, 69479), (53, 69461), (54, 69449), (55, 69434), (58, 69422), (59, 69419), (60, 69368), (61, 69287),

Gene: Butterball\_95 Start: 71135, Stop: 70239, Start Num: 13

Candidate Starts for Butterball\_95:

(Start: 13 @71135 has 31 MA's), (15, 71114), (27, 70979), (33, 70934), (34, 70886), (37, 70808), (38, 70772), (39, 70760), (41, 70676), (44, 70661), (45, 70637), (46, 70610), (51, 70496), (52, 70493), (53, 70475), (54, 70463), (55, 70448), (56, 70445), (58, 70436), (59, 70433), (60, 70382), (61, 70301),

Gene: CathyBurgh\_94 Start: 70172, Stop: 69255, Start Num: 13

Candidate Starts for CathyBurgh\_94:

(Start: 13 @70172 has 31 MA's), (15, 70151), (18, 70118), (21, 70076), (27, 70016), (31, 69986), (37, 69845), (39, 69797), (41, 69707), (44, 69692), (45, 69668), (46, 69641), (48, 69614), (51, 69512), (52, 69509), (53, 69491), (54, 69479), (55, 69464), (58, 69452), (59, 69449), (60, 69398), (61, 69317),

Gene: Charianelly\_86 Start: 68596, Stop: 67598, Start Num: 3

Candidate Starts for Charianelly\_86:

(1, 68605), (2, 68599), (Start: 3 @68596 has 25 MA's), (11, 68512), (14, 68482), (16, 68470), (29, 68332), (31, 68305), (32, 68293), (33, 68290), (35, 68209), (37, 68164), (43, 68029), (44, 68023), (46, 67972), (47, 67960), (53, 67834), (54, 67822), (55, 67807), (56, 67804), (57, 67798), (58, 67795), (59, 67792), (60, 67741), (64, 67624),

Gene: Chelms\_94 Start: 70726, Stop: 69830, Start Num: 13

Candidate Starts for Chelms\_94:

(4, 70792), (Start: 13 @70726 has 31 MA's), (19, 70642), (31, 70549), (32, 70537), (34, 70486), (36, 70429), (37, 70408), (38, 70372), (39, 70360), (40, 70327), (41, 70270), (44, 70255), (45, 70231), (46, 70204), (51, 70087), (52, 70084), (53, 70066), (54, 70054), (55, 70039), (56, 70036), (58, 70027), (59, 70024), (60, 69973), (62, 69889), (63, 69862),

Gene: CinnamonToast\_98 Start: 71698, Stop: 70802, Start Num: 13

Candidate Starts for CinnamonToast\_98:

(4, 71764), (8, 71728), (Start: 13 @71698 has 31 MA's), (15, 71677), (18, 71644), (21, 71602), (27, 71542), (33, 71497), (34, 71449), (37, 71371), (38, 71335), (39, 71323), (41, 71239), (44, 71224), (45, 71200), (46, 71173), (51, 71059), (52, 71056), (53, 71038), (54, 71026), (55, 71011), (56, 71008), (58, 70999), (59, 70996), (60, 70945), (61, 70864),

Gene: Crete\_95 Start: 70771, Stop: 69866, Start Num: 13

Candidate Starts for Crete\_95:

(4, 70837), (5, 70825), (6, 70822), (Start: 13 @70771 has 31 MA's), (21, 70675), (24, 70654), (29, 70609), (31, 70585), (33, 70570), (34, 70522), (36, 70465), (37, 70444), (39, 70396), (40, 70363), (41, 70306), (44, 70291), (45, 70267), (46, 70240), (51, 70123), (52, 70120), (53, 70102), (54, 70090), (55, 70075), (56, 70072), (58, 70063), (59, 70060), (60, 70009), (62, 69925), (63, 69898),

Gene: Dakiti\_96 Start: 71669, Stop: 70773, Start Num: 13

Candidate Starts for Dakiti\_96:

(4, 71735), (Start: 13 @71669 has 31 MA's), (19, 71585), (31, 71492), (32, 71480), (34, 71429), (36, 71372), (37, 71351), (38, 71315), (39, 71303), (40, 71270), (41, 71213), (44, 71198), (45, 71174), (46, 71147), (51, 71030), (52, 71027), (53, 71009), (54, 70997), (55, 70982), (56, 70979), (58, 70970), (59, 70967), (60, 70916), (62, 70832), (63, 70805),

Gene: Damp\_86 Start: 67760, Stop: 66762, Start Num: 3

Candidate Starts for Damp\_86:

(1, 67769), (2, 67763), (Start: 3 @67760 has 25 MA's), (11, 67676), (14, 67646), (16, 67634), (29, 67496), (31, 67469), (32, 67457), (33, 67454), (35, 67373), (37, 67328), (43, 67193), (44, 67187), (46, 67136), (47, 67124), (53, 66998), (54, 66986), (55, 66971), (56, 66968), (57, 66962), (58, 66959), (59, 66956), (60, 66905), (64, 66788),

Gene: Diabla\_98 Start: 71134, Stop: 70223, Start Num: 12

Candidate Starts for Diabla\_98:

(4, 71200), (7, 71173), (9, 71158), (Start: 12 @71134 has 5 MA's), (20, 71038), (22, 71026), (31, 70939), (32, 70927), (37, 70798), (38, 70762), (39, 70750), (40, 70717), (42, 70654), (44, 70645), (46, 70594), (49, 70537), (51, 70480), (52, 70477), (53, 70459), (54, 70447), (55, 70432), (56, 70429), (58, 70420), (59, 70417), (60, 70366), (64, 70249),

Gene: Eggsie\_91 Start: 68690, Stop: 67779, Start Num: 12

Candidate Starts for Eggsie\_91:

(4, 68756), (7, 68729), (9, 68714), (Start: 12 @68690 has 5 MA's), (20, 68594), (22, 68582), (23, 68576), (30, 68513), (31, 68495), (37, 68354), (38, 68318), (39, 68306), (40, 68273), (42, 68210), (44, 68201), (46, 68150), (49, 68093), (51, 68036), (52, 68033), (53, 68015), (54, 68003), (55, 67988), (56, 67985), (58, 67976), (59, 67973), (60, 67922), (64, 67805),

Gene: Ekhein\_96 Start: 70186, Stop: 69269, Start Num: 13

Candidate Starts for Ekhein\_96:

(Start: 13 @70186 has 31 MA's), (15, 70165), (27, 70030), (33, 69985), (34, 69937), (37, 69859), (38, 69823), (39, 69811), (41, 69721), (42, 69715), (44, 69706), (45, 69682), (46, 69655), (48, 69628), (51, 69526), (52, 69523), (53, 69505), (54, 69493), (55, 69478), (56, 69475), (58, 69466), (59, 69463), (60, 69412), (61, 69331),

Gene: Exiguo\_93 Start: 69605, Stop: 68694, Start Num: 13

Candidate Starts for Exiguo\_93:

(4, 69671), (Start: 13 @69605 has 31 MA's), (15, 69584), (18, 69551), (21, 69509), (27, 69449), (31, 69419), (37, 69278), (39, 69230), (41, 69146), (44, 69131), (45, 69107), (46, 69080), (48, 69053), (51, 68951), (52, 68948), (53, 68930), (54, 68918), (55, 68903), (58, 68891), (59, 68888), (60, 68837), (61, 68756),

Gene: FelixAlejandro\_97 Start: 71648, Stop: 70752, Start Num: 13

Candidate Starts for FelixAlejandro\_97:

(Start: 13 @71648 has 31 MA's), (15, 71627), (27, 71492), (33, 71447), (34, 71399), (37, 71321), (38, 71285), (39, 71273), (41, 71189), (44, 71174), (45, 71150), (46, 71123), (51, 71009), (52, 71006), (53, 70988), (54, 70976), (55, 70961), (56, 70958), (58, 70949), (59, 70946), (60, 70895), (61, 70814),

Gene: Flakey\_95 Start: 71083, Stop: 70166, Start Num: 13

Candidate Starts for Flakey\_95:

(4, 71149), (8, 71113), (Start: 13 @71083 has 31 MA's), (15, 71062), (18, 71029), (21, 70987), (27, 70927), (31, 70897), (37, 70756), (38, 70720), (39, 70708), (41, 70618), (42, 70612), (44, 70603), (45, 70579), (46, 70552), (48, 70525), (51, 70423), (52, 70420), (53, 70402), (54, 70390), (55, 70375), (56, 70372), (58, 70363), (59, 70360), (60, 70309), (61, 70228),

Gene: GalacticEye\_86 Start: 68554, Stop: 67556, Start Num: 3

Candidate Starts for GalacticEye\_86:

(1, 68563), (2, 68557), (Start: 3 @68554 has 25 MA's), (11, 68470), (14, 68440), (16, 68428), (29, 68290), (31, 68263), (32, 68251), (33, 68248), (35, 68167), (37, 68122), (43, 67987), (44, 67981), (46, 67930), (47, 67918), (53, 67792), (54, 67780), (55, 67765), (56, 67762), (57, 67756), (58, 67753), (59, 67750), (60, 67699), (64, 67582),

Gene: Gorko\_93 Start: 69355, Stop: 68438, Start Num: 13

Candidate Starts for Gorko\_93:

(Start: 13 @69355 has 31 MA's), (15, 69334), (18, 69301), (21, 69259), (27, 69199), (31, 69169), (33, 69154), (36, 69049), (37, 69028), (38, 68992), (39, 68980), (41, 68890), (42, 68884), (44, 68875), (45,

68851), (46, 68824), (48, 68797), (51, 68695), (52, 68692), (53, 68674), (54, 68662), (55, 68647), (56, 68644), (58, 68635), (59, 68632), (60, 68581), (61, 68500),

Gene: GourdThymes\_94 Start: 70193, Stop: 69282, Start Num: 13

Candidate Starts for GourdThymes\_94:

(Start: 13 @70193 has 31 MA's), (15, 70172), (18, 70139), (21, 70097), (27, 70037), (31, 70007), (37, 69866), (39, 69818), (41, 69734), (44, 69719), (46, 69668), (48, 69641), (51, 69539), (52, 69536), (53, 69518), (54, 69506), (55, 69491), (56, 69488), (58, 69479), (59, 69476), (60, 69425), (61, 69344),

Gene: Guillaume\_85 Start: 68607, Stop: 67609, Start Num: 3

Candidate Starts for Guillaume\_85:

(1, 68616), (2, 68610), (Start: 3 @68607 has 25 MA's), (11, 68523), (14, 68493), (16, 68481), (29, 68343), (31, 68316), (32, 68304), (33, 68301), (35, 68220), (37, 68175), (43, 68040), (44, 68034), (46, 67983), (47, 67971), (53, 67845), (54, 67833), (55, 67818), (56, 67815), (57, 67809), (58, 67806), (59, 67803), (60, 67752), (64, 67635),

Gene: Hail2Pitt\_84 Start: 69080, Stop: 68082, Start Num: 3

Candidate Starts for Hail2Pitt\_84:

(1, 69089), (2, 69083), (Start: 3 @69080 has 25 MA's), (11, 68996), (14, 68966), (16, 68954), (29, 68816), (31, 68789), (32, 68777), (33, 68774), (35, 68693), (37, 68648), (43, 68513), (44, 68507), (46, 68456), (47, 68444), (53, 68318), (54, 68306), (55, 68291), (56, 68288), (57, 68282), (58, 68279), (59, 68276), (60, 68225), (64, 68108),

Gene: Harambe\_85 Start: 68874, Stop: 67876, Start Num: 3

Candidate Starts for Harambe\_85:

(1, 68883), (2, 68877), (Start: 3 @68874 has 25 MA's), (11, 68790), (14, 68760), (16, 68748), (29, 68610), (31, 68583), (32, 68571), (33, 68568), (35, 68487), (37, 68442), (43, 68307), (44, 68301), (46, 68250), (47, 68238), (53, 68112), (54, 68100), (55, 68085), (56, 68082), (57, 68076), (58, 68073), (59, 68070), (60, 68019), (64, 67902),

Gene: Hello\_85 Start: 68836, Stop: 67838, Start Num: 3

Candidate Starts for Hello\_85:

(1, 68845), (2, 68839), (Start: 3 @68836 has 25 MA's), (11, 68752), (14, 68722), (16, 68710), (29, 68572), (31, 68545), (32, 68533), (33, 68530), (35, 68449), (37, 68404), (43, 68269), (44, 68263), (46, 68212), (47, 68200), (53, 68074), (54, 68062), (55, 68047), (56, 68044), (57, 68038), (58, 68035), (59, 68032), (60, 67981), (64, 67864),

Gene: Hotorobo\_96 Start: 71054, Stop: 70143, Start Num: 13

Candidate Starts for Hotorobo\_96:

(8, 71084), (Start: 13 @71054 has 31 MA's), (15, 71033), (18, 71000), (21, 70958), (27, 70898), (33, 70853), (36, 70748), (37, 70727), (38, 70691), (39, 70679), (41, 70595), (44, 70580), (45, 70556), (46, 70529), (48, 70502), (51, 70400), (52, 70397), (53, 70379), (54, 70367), (55, 70352), (56, 70349), (58, 70340), (59, 70337), (60, 70286), (61, 70205),

Gene: Jams\_86 Start: 67884, Stop: 66886, Start Num: 3

Candidate Starts for Jams\_86:

(1, 67893), (2, 67887), (Start: 3 @67884 has 25 MA's), (11, 67800), (14, 67770), (16, 67758), (29, 67620), (31, 67593), (32, 67581), (33, 67578), (35, 67497), (37, 67452), (43, 67317), (44, 67311), (46, 67260), (47, 67248), (53, 67122), (54, 67110), (55, 67095), (56, 67092), (57, 67086), (58, 67083), (59, 67080), (60, 67029), (64, 66912),

Gene: Jellybones\_95 Start: 71336, Stop: 70440, Start Num: 13

Candidate Starts for Jellybones\_95:

(Start: 13 @71336 has 31 MA's), (15, 71315), (21, 71240), (27, 71180), (31, 71150), (33, 71135), (34, 71087), (37, 71009), (38, 70973), (39, 70961), (41, 70877), (44, 70862), (45, 70838), (46, 70811), (51, 70697), (52, 70694), (53, 70676), (54, 70664), (55, 70649), (56, 70646), (58, 70637), (59, 70634), (60, 70583), (61, 70502),

Gene: John316\_97 Start: 71313, Stop: 70396, Start Num: 13

Candidate Starts for John316\_97:

(8, 71343), (Start: 13 @71313 has 31 MA's), (15, 71292), (21, 71217), (27, 71157), (31, 71127), (37, 70986), (38, 70950), (39, 70938), (41, 70848), (42, 70842), (44, 70833), (45, 70809), (46, 70782), (48, 70755), (51, 70653), (52, 70650), (53, 70632), (54, 70620), (55, 70605), (58, 70593), (59, 70590), (60, 70539), (61, 70458),

Gene: Jormungandr\_85 Start: 68589, Stop: 67591, Start Num: 3

Candidate Starts for Jormungandr\_85:

(1, 68598), (2, 68592), (Start: 3 @68589 has 25 MA's), (11, 68505), (14, 68475), (16, 68463), (29, 68325), (31, 68298), (32, 68286), (33, 68283), (35, 68202), (37, 68157), (43, 68022), (44, 68016), (46, 67965), (47, 67953), (53, 67827), (54, 67815), (55, 67800), (56, 67797), (57, 67791), (58, 67788), (59, 67785), (60, 67734), (64, 67617),

Gene: Kaseim\_86 Start: 68031, Stop: 67033, Start Num: 3

Candidate Starts for Kaseim\_86:

(1, 68040), (2, 68034), (Start: 3 @68031 has 25 MA's), (11, 67947), (14, 67917), (16, 67905), (29, 67767), (31, 67740), (32, 67728), (33, 67725), (35, 67644), (37, 67599), (43, 67464), (44, 67458), (46, 67407), (47, 67395), (53, 67269), (54, 67257), (55, 67242), (56, 67239), (57, 67233), (58, 67230), (59, 67227), (60, 67176), (64, 67059),

Gene: Kelzog\_96 Start: 70580, Stop: 69669, Start Num: 13

Candidate Starts for Kelzog\_96:

(Start: 13 @70580 has 31 MA's), (15, 70559), (18, 70526), (21, 70484), (27, 70424), (31, 70394), (37, 70253), (39, 70205), (41, 70121), (42, 70115), (44, 70106), (45, 70082), (46, 70055), (48, 70028), (51, 69926), (52, 69923), (53, 69905), (54, 69893), (55, 69878), (56, 69875), (58, 69866), (59, 69863), (60, 69812), (61, 69731),

Gene: Lahirium\_86 Start: 69625, Stop: 68627, Start Num: 3

Candidate Starts for Lahirium\_86:

(1, 69634), (2, 69628), (Start: 3 @69625 has 25 MA's), (11, 69541), (14, 69511), (16, 69499), (29, 69361), (31, 69334), (32, 69322), (33, 69319), (35, 69238), (37, 69193), (43, 69058), (44, 69052), (46, 69001), (47, 68989), (53, 68863), (54, 68851), (55, 68836), (56, 68833), (57, 68827), (58, 68824), (59, 68821), (60, 68770), (64, 68653),

Gene: Lidong\_86 Start: 68846, Stop: 67848, Start Num: 3

Candidate Starts for Lidong\_86:

(1, 68855), (2, 68849), (Start: 3 @68846 has 25 MA's), (11, 68762), (14, 68732), (16, 68720), (29, 68582), (31, 68555), (32, 68543), (33, 68540), (35, 68459), (37, 68414), (43, 68279), (44, 68273), (46, 68222), (47, 68210), (53, 68084), (54, 68072), (55, 68057), (56, 68054), (57, 68048), (58, 68045), (59, 68042), (60, 67991), (64, 67874),

Gene: Linetti\_94 Start: 71695, Stop: 70790, Start Num: 13

Candidate Starts for Linetti\_94:

(4, 71761), (Start: 13 @71695 has 31 MA's), (21, 71599), (24, 71578), (29, 71533), (31, 71509), (33, 71494), (34, 71446), (36, 71389), (37, 71368), (38, 71332), (39, 71320), (40, 71287), (41, 71230), (44, 71215), (45, 71191), (46, 71164), (51, 71047), (52, 71044), (53, 71026), (55, 70999), (56, 70996), (58, 70987), (59, 70984), (60, 70933), (62, 70849), (63, 70822),

Gene: Lizzo\_94 Start: 70172, Stop: 69255, Start Num: 13

Candidate Starts for Lizzo\_94:

(Start: 13 @70172 has 31 MA's), (15, 70151), (18, 70118), (21, 70076), (27, 70016), (31, 69986), (37, 69845), (39, 69797), (41, 69707), (44, 69692), (45, 69668), (46, 69641), (48, 69614), (51, 69512), (52, 69509), (53, 69491), (54, 69479), (55, 69464), (58, 69452), (59, 69449), (60, 69398), (61, 69317),

Gene: Luker\_87 Start: 68899, Stop: 67901, Start Num: 3

Candidate Starts for Luker\_87:

(1, 68908), (2, 68902), (Start: 3 @68899 has 25 MA's), (11, 68815), (14, 68785), (16, 68773), (29, 68635), (31, 68608), (32, 68596), (33, 68593), (35, 68512), (37, 68467), (43, 68332), (44, 68326), (46, 68275), (47, 68263), (53, 68137), (54, 68125), (55, 68110), (56, 68107), (57, 68101), (58, 68098), (59, 68095), (60, 68044), (64, 67927),

Gene: Minos\_87 Start: 68573, Stop: 67587, Start Num: 3

Candidate Starts for Minos\_87:

(1, 68582), (2, 68576), (Start: 3 @68573 has 25 MA's), (11, 68501), (14, 68471), (16, 68459), (29, 68321), (32, 68282), (33, 68279), (35, 68198), (37, 68153), (43, 68018), (44, 68012), (46, 67961), (47, 67949), (53, 67823), (54, 67811), (55, 67796), (56, 67793), (57, 67787), (58, 67784), (59, 67781), (60, 67730), (64, 67613),

Gene: Monty\_94 Start: 69874, Stop: 68957, Start Num: 13

Candidate Starts for Monty\_94:

(Start: 13 @69874 has 31 MA's), (15, 69853), (18, 69820), (21, 69778), (27, 69718), (31, 69688), (37, 69547), (38, 69511), (39, 69499), (41, 69409), (42, 69403), (44, 69394), (45, 69370), (46, 69343), (48, 69316), (51, 69214), (52, 69211), (53, 69193), (54, 69181), (55, 69166), (56, 69163), (58, 69154), (59, 69151), (60, 69100), (61, 69019),

Gene: MrWormie\_86 Start: 67587, Stop: 66589, Start Num: 3

Candidate Starts for MrWormie\_86:

(1, 67596), (2, 67590), (Start: 3 @67587 has 25 MA's), (11, 67503), (14, 67473), (16, 67461), (29, 67323), (31, 67296), (32, 67284), (33, 67281), (35, 67200), (37, 67155), (43, 67020), (44, 67014), (46, 66963), (47, 66951), (53, 66825), (54, 66813), (55, 66798), (56, 66795), (57, 66789), (58, 66786), (59, 66783), (60, 66732), (64, 66615),

Gene: Msay19\_98 Start: 71931, Stop: 71035, Start Num: 13

Candidate Starts for Msay19\_98:

(Start: 13 @71931 has 31 MA's), (15, 71910), (27, 71775), (33, 71730), (34, 71682), (37, 71604), (38, 71568), (39, 71556), (41, 71472), (42, 71466), (44, 71457), (45, 71433), (46, 71406), (51, 71292), (52, 71289), (54, 71259), (55, 71244), (56, 71241), (58, 71232), (59, 71229), (60, 71178), (64, 71061),

Gene: Neoevie\_85 Start: 68847, Stop: 67849, Start Num: 3

Candidate Starts for Neoevie\_85:

(1, 68856), (2, 68850), (Start: 3 @68847 has 25 MA's), (11, 68763), (14, 68733), (16, 68721), (29, 68583), (31, 68556), (32, 68544), (33, 68541), (35, 68460), (37, 68415), (43, 68280), (44, 68274), (46, 68223), (47, 68211), (53, 68085), (54, 68073), (55, 68058), (56, 68055), (57, 68049), (58, 68046), (59, 68043), (60, 67992), (64, 67875),

Gene: Newt\_87 Start: 68916, Stop: 67918, Start Num: 3

Candidate Starts for Newt\_87:

(1, 68925), (2, 68919), (Start: 3 @68916 has 25 MA's), (11, 68832), (14, 68802), (16, 68790), (29, 68652), (31, 68625), (32, 68613), (33, 68610), (35, 68529), (37, 68484), (43, 68349), (44, 68343), (46, 68292), (47, 68280), (53, 68154), (54, 68142), (55, 68127), (56, 68124), (57, 68118), (58, 68115), (59,

68112), (60, 68061), (64, 67944),

Gene: Nimi13\_85 Start: 68597, Stop: 67599, Start Num: 3

Candidate Starts for Nimi13\_85:

(1, 68606), (2, 68600), (Start: 3 @68597 has 25 MA's), (11, 68513), (14, 68483), (16, 68471), (29, 68333), (31, 68306), (32, 68294), (33, 68291), (35, 68210), (37, 68165), (43, 68030), (44, 68024), (46, 67973), (47, 67961), (53, 67835), (54, 67823), (55, 67808), (56, 67805), (57, 67799), (58, 67796), (59, 67793), (60, 67742), (64, 67625),

Gene: PierreThree\_94 Start: 71300, Stop: 70404, Start Num: 13

Candidate Starts for PierreThree\_94:

(4, 71366), (Start: 13 @71300 has 31 MA's), (19, 71216), (31, 71123), (32, 71111), (34, 71060), (36, 71003), (37, 70982), (38, 70946), (39, 70934), (40, 70901), (41, 70844), (44, 70829), (45, 70805), (46, 70778), (51, 70661), (52, 70658), (53, 70640), (54, 70628), (55, 70613), (56, 70610), (58, 70601), (59, 70598), (60, 70547), (62, 70463), (63, 70436),

Gene: PokyPuppy\_92 Start: 70572, Stop: 69670, Start Num: 12

Candidate Starts for PokyPuppy\_92:

(Start: 12 @70572 has 5 MA's), (24, 70449), (25, 70437), (28, 70413), (31, 70389), (32, 70377), (37, 70248), (38, 70212), (40, 70167), (44, 70095), (49, 69984), (50, 69951), (51, 69927), (52, 69924), (54, 69894), (55, 69879), (58, 69867), (59, 69864), (60, 69813),

Gene: Poland\_98 Start: 71913, Stop: 71017, Start Num: 13

Candidate Starts for Poland\_98:

(Start: 13 @71913 has 31 MA's), (15, 71892), (27, 71757), (33, 71712), (34, 71664), (37, 71586), (38, 71550), (39, 71538), (41, 71454), (42, 71448), (44, 71439), (45, 71415), (46, 71388), (51, 71274), (52, 71271), (54, 71241), (55, 71226), (56, 71223), (58, 71214), (59, 71211), (60, 71160), (64, 71043),

Gene: RemRem\_97 Start: 70163, Stop: 69252, Start Num: 13

Candidate Starts for RemRem\_97:

(Start: 13 @70163 has 31 MA's), (15, 70142), (18, 70109), (21, 70067), (27, 70007), (31, 69977), (37, 69836), (39, 69788), (41, 69704), (44, 69689), (45, 69665), (46, 69638), (48, 69611), (51, 69509), (52, 69506), (53, 69488), (54, 69476), (55, 69461), (58, 69449), (59, 69446), (60, 69395), (61, 69314),

Gene: RoyalG\_93 Start: 69881, Stop: 68970, Start Num: 12

Candidate Starts for RoyalG\_93:

(Start: 12 @69881 has 5 MA's), (20, 69785), (22, 69773), (31, 69686), (32, 69674), (37, 69545), (38, 69509), (39, 69497), (40, 69464), (42, 69401), (44, 69392), (46, 69341), (49, 69284), (51, 69227), (52, 69224), (53, 69206), (54, 69194), (55, 69179), (58, 69167), (59, 69164), (60, 69113), (64, 68996),

Gene: Sam12\_93 Start: 69602, Stop: 68691, Start Num: 13

Candidate Starts for Sam12\_93:

(4, 69668), (Start: 13 @69602 has 31 MA's), (15, 69581), (18, 69548), (21, 69506), (27, 69446), (31, 69416), (37, 69275), (39, 69227), (41, 69143), (44, 69128), (45, 69104), (46, 69077), (48, 69050), (51, 68948), (52, 68945), (53, 68927), (54, 68915), (55, 68900), (58, 68888), (59, 68885), (60, 68834), (61, 68753),

Gene: Shelley\_86 Start: 68073, Stop: 67075, Start Num: 3

Candidate Starts for Shelley\_86:

(1, 68082), (2, 68076), (Start: 3 @68073 has 25 MA's), (11, 67989), (14, 67959), (16, 67947), (29, 67809), (31, 67782), (32, 67770), (33, 67767), (35, 67686), (37, 67641), (43, 67506), (44, 67500), (46, 67449), (47, 67437), (53, 67311), (54, 67299), (55, 67284), (56, 67281), (57, 67275), (58, 67272), (59, 67269), (60, 67218), (64, 67101),

Gene: Sombrero\_95 Start: 70215, Stop: 69319, Start Num: 13

Candidate Starts for Sombrero\_95:

(Start: 13 @70215 has 31 MA's), (15, 70194), (27, 70059), (33, 70014), (34, 69966), (37, 69888), (38, 69852), (39, 69840), (41, 69756), (44, 69741), (45, 69717), (46, 69690), (51, 69576), (52, 69573), (53, 69555), (54, 69543), (55, 69528), (56, 69525), (58, 69516), (59, 69513), (60, 69462), (61, 69381),

Gene: Squibbles\_94 Start: 70689, Stop: 69772, Start Num: 13

Candidate Starts for Squibbles\_94:

(4, 70755), (8, 70719), (Start: 13 @70689 has 31 MA's), (15, 70668), (18, 70635), (21, 70593), (27, 70533), (31, 70503), (33, 70488), (36, 70383), (37, 70362), (38, 70326), (39, 70314), (41, 70224), (42, 70218), (44, 70209), (45, 70185), (46, 70158), (48, 70131), (51, 70029), (52, 70026), (53, 70008), (54, 69996), (55, 69981), (56, 69978), (58, 69969), (59, 69966), (60, 69915), (61, 69834),

Gene: SteveFrench\_92 Start: 70121, Stop: 69210, Start Num: 12

Candidate Starts for SteveFrench\_92:

(Start: 12 @70121 has 5 MA's), (20, 70025), (22, 70013), (23, 70007), (26, 69962), (31, 69926), (32, 69914), (37, 69785), (38, 69749), (39, 69737), (40, 69704), (42, 69641), (44, 69632), (46, 69581), (49, 69524), (51, 69467), (52, 69464), (53, 69446), (54, 69434), (55, 69419), (58, 69407), (59, 69404), (60, 69353), (64, 69236),

Gene: Sticker17\_86 Start: 68561, Stop: 67563, Start Num: 3

Candidate Starts for Sticker17\_86:

(1, 68570), (2, 68564), (Start: 3 @68561 has 25 MA's), (11, 68477), (14, 68447), (16, 68435), (29, 68297), (31, 68270), (32, 68258), (33, 68255), (35, 68174), (37, 68129), (43, 67994), (44, 67988), (46, 67937), (47, 67925), (53, 67799), (54, 67787), (55, 67772), (56, 67769), (57, 67763), (58, 67760), (59, 67757), (60, 67706), (64, 67589),

Gene: Teal\_85 Start: 69052, Stop: 68054, Start Num: 3

Candidate Starts for Teal\_85:

(1, 69061), (2, 69055), (Start: 3 @69052 has 25 MA's), (11, 68968), (14, 68938), (16, 68926), (29, 68788), (31, 68761), (32, 68749), (33, 68746), (35, 68665), (37, 68620), (43, 68485), (44, 68479), (46, 68428), (47, 68416), (53, 68290), (54, 68278), (55, 68263), (56, 68260), (57, 68254), (58, 68251), (59, 68248), (60, 68197), (64, 68080),

Gene: Woes\_85 Start: 69103, Stop: 68105, Start Num: 3

Candidate Starts for Woes\_85:

(1, 69112), (2, 69106), (Start: 3 @69103 has 25 MA's), (11, 69019), (14, 68989), (16, 68977), (29, 68839), (31, 68812), (32, 68800), (33, 68797), (35, 68716), (37, 68671), (43, 68536), (44, 68530), (46, 68479), (47, 68467), (53, 68341), (54, 68329), (55, 68314), (56, 68311), (57, 68305), (58, 68302), (59, 68299), (60, 68248), (64, 68131),

Gene: Worcestershire\_93 Start: 69594, Stop: 68677, Start Num: 13

Candidate Starts for Worcestershire\_93:

(Start: 13 @69594 has 31 MA's), (15, 69573), (27, 69438), (33, 69393), (37, 69267), (38, 69231), (39, 69219), (41, 69129), (42, 69123), (44, 69114), (45, 69090), (46, 69063), (48, 69036), (51, 68934), (52, 68931), (53, 68913), (54, 68901), (55, 68886), (56, 68883), (58, 68874), (59, 68871), (60, 68820), (61, 68739),